PCPlus CAMPAIGN

➔ A variety of complaints this month include missing PCs, PDA upgrades and compliments to Evesham and Viglen

X-files PC

Dear **PC Plus**,

On Friday 7th April 2000, I ordered a PC from Avanti/Sight&Sound. I paid for the full amount straight away with my debit card and this money was instantly withdrawn from my bank account. I was given an order number 68647 and Avanti/Sight&Sound promised that it would deliver within seven working days.

The PC never arrived. On Wednesday 26th April I asked for a full refund and I have been calling them every day since, to enquire about this problem. Most of the time I don't get to talk to anyone important and none of my calls have ever been returned.

Furthermore, I have sent Avanti/Sight&Sound four faxes. In the last one, dated the 22nd May, I threatened to take them to court but the company has never replied to any of them. I have got in touch with the local trading standards offices and with the Citizens Advice Bureau, as the company has kept my money for almost two months and I have yet to see my ordered PC.

Marco Masina

↑Calling Mulder and Scully: this Avanti PC seems to have disappeared without a trace.

OUR REPLY: We contacted Andor Miles Board of the Avanti/Sight&Sound group. He responded: "The same day the letter was written the customer services manager contacted Mr Masina and full refund was processed on the 30th May, the same date of the letter to PC Plus. This was a highly unusual and most unfortunate case and we have still been unable to trace the PC system. The goods were despatched normally and on schedule but Mr Masina never received them. The non-arrival of the PC is still being investigated, but the PC system itself has not been located, nor returned to us. We have, of course, refunded the customer, despite the fact the goods cannot be located and have never been returned."

↓Upgrade your E-Series Cassiopeia Personal Data Assistant by giving Casio a ring on 0208 208 948.

Cassiopeia upgrade

Dear **PC Plus**,

Being the proud owner of a Casio Cassiopeia E105, I was pleased to read that Casio was offering a 'trade-in' to existing owners for the new PocketPC E115 model. I logged on to Casio's Web site, only to find that the offer was open to US and Canadian owners only. I rang up Casio UK and was then informed that it had no plans to introduce the offer in the UK, and this was purely a US and Canadian offer.

Question: How much longer are we willing to put up with being classed as second class in this respect. We are willing to pay more for hardware, software, cars, petrol and so on. You name it, we pay more for it than our European and US counterparts.

Bernie Huddleston

OUR REPLY: We contacted Amanda Recknall, PR person for Casio UK. She replied: "As a result of consumer interest in upgrading from E-105 to E-115, Casio Electronics Co Ltd has made the decision to offer this service for the UK market.

From 1st July, customers can trade in their E-105 for a new E-115 for a one-off cost of £155 including VAT. Anybody interested in this should contact the Cassiopeia Helpdesk on 0208 208 0948." PCP

Problems with Carrera

Dear **PC Plus**,

I am writing you this letter to make you aware of the difficulties since taking delivery of a Carrera machine on the 8th March and its replacement on the 30th of the same month. It took four weeks to get one of them working properly which is totally unacceptable. It's like buying a new car and not being able to get out of first gear.

I have suffered a catalogue of problems – an unhelpful attitude from customer service, the three visits by engineers, hassle with the delivery, and a great deal of distress and concern that I have unwisely spent almost £2,500.

Ironically, I spent several months choosing a machine and the good reports in **PC Plus** clinched it for Carrera. I don't blame **PC Plus** – you have obviously been luckier than me but think you might be interested to learn of our experiences – hence this 'blow by blow' account.

I am a patient person but these problems have, so far, wasted many hours of my time and deprived me of a properly functioning computer for four weeks. I don't propose to list each and every incident – Carrera can look at the customer log for details. In addition, I would ask you to discuss what has happened with its engineer, Nick, who has at least had the decency to apologise about the position and has worked hard to overcome the failure of its two machines. He is Carrera's saving grace so far.

Now I shall be grateful for recompense from Carrera, please. I expect that it usually responds to justified letters of complaint by offering software or

→Time's PR person unfortunately ran out of time. We never got a reply about this problematic computer.

upgrades, but neither appeal to me. I don't want any more visits until the machine breaks down again so I'll be asking for a refund of £250 which is around a discount of 10 per cent. In the circumstances, I feel this should be acceptable to any company with a reasonable degree of integrity and care for its customers.

I look forward to a reply and some unsolicited acknowledgement from yourself would be appreciated. Perhaps Carrera was hoping that I would keep quiet and go away – afraid not.

As far as I am concerned this is merely indicative of a 'can't do/don't care' approach to service. Such complacency in a highly competitive market is certainly brave, if nothing else.

D J Green

OUR REPLY: We received this reply from David Coburn, customer services manager of Carrera Technology: "I was quite horrified to hear the series of events that have occurred since the purchase of your Carrera system. I can assure you from the outset that this is not typical of our company. I fully sympathise with your situation as no one would wish to provide any system to a customer with the problems that you have encountered.

"I have spoken to our site engineer, Nick and there are no obvious reasons why these problems have occurred. The systems that we build are fully tested before dispatch and no faults were found by our Quality Control. It is, therefore, very important that we look into this matter further to avoid any repeat of such event.

"At Carrera we indeed have a great deal of integrity and customer care is paramount. I fully understand the reasons behind your request for recompense, however, I am sure that you are aware of the small profit margins made by manufacturers like ourselves. Therefore, it is not possible to consider a rebate such as you have requested.

"It is normal in these rare circumstances to offer a goodwill gesture similar to the ones you mentioned in your letter. I do hope you will reconsider this and enable me to discuss further with you a possible upgrade to your system which we would carry at your premises and at your convenience." PCP

Keeping Time

Dear **PC Plus**,

On 4th March 2000 I bought a computer from Time Computers in Bradford. This was delivered within ten days and, initially, all seemed well with it.

Soon, however, I noticed that the computer hangs if left for a period and requires a re-boot. I thought that this might be due to a faulty screensaver so I switched screensavers off, but the problem continues. I then tried switching off the power management system but still the problem continues.

I have been trying to contact its hardware helpline (01282 770 033) for over three weeks but only get the engaged tone during its opening hours.

Its handbook quotes opening hours as Monday to Friday 8:30am to 8:00pm; Saturday and Sunday 9:00am to 5:00pm. According to the answering machine, these are now Monday to Friday 8:30am to 6:00pm; Saturday 9:00am to 5:00pm; closed on Sunday.

As Time Computers wants you to be at your machine when you contact it, it rather limits the times that I can contact them as I work 9:00am to 5:pm during the week. It does have a Web Site for support, but this must be accessed via its own ISP (Supanet) and you must supply your account password which, in my case, it doesn't recognise. This lack of support is particularly frustrating because I paid extra for a support package.

I need to have this computer working properly as I am visually impaired and it is my means of communication with other people.

Iain Gordon

OUR REPLY: We left a message with a spokesperson at Time Computers but they didn't get back to us, either. Check back next month! PCP

Write in

E-mail: campaign@pcplusmag.co.uk

Write: Campaign, PC Plus, 30 Monmouth Street, Bath BA1 2BW

Fax: 01225 732295

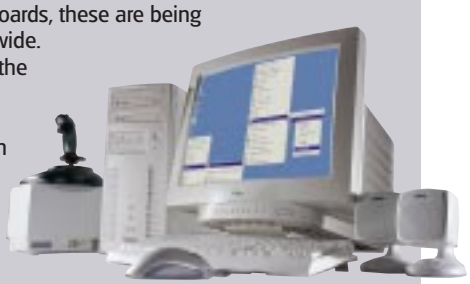
→ Some happy customers

Campaign isn't only about complaints; we also want to hear about good service from the computer industry too. Here are a couple of letters that we received about two computer manufacturers that will make you smile

Dear **PC Plus**,

You reviewed the Viglen Homepro P3-800 MLR in the May issue of **PC Plus** and gave it a Value award. I bought one and it has proved to be fast and stable. However, on a small number of occasions it re-booted itself for no apparent reason, there were no error messages from any programs just a sudden and unexpected re-boot.

I have since found out that this is due to a fault with a Memory Translator Hub component found on some motherboards, these are being recalled worldwide.



↑Viglen sorted out Intel's motherboard problem on this PC very quickly.

Anyway, to the reason for my note: I sent an e-mail to Viglen technical support at 7pm on Wednesday 31st May, a named representative replied by 11am the next day. They confirmed that my motherboard had the faulty component and said that they would replace it and also change the 256MB RAM memory from Dimms to Rimms.

They gave me a call reference number, asked me when I would be in and said that they would send an engineer round. It is now 5th June, the engineer has been, the machine is fixed – with a 133MHz motherboard in place of the old 100MHz model. I read so often in your magazine about the failure of technical support that it was refreshing to experience an excellent service from Viglen, especially when the problem was caused by a faulty component outside of its control.

Ian Fozzard

Dear **PC Plus**,

After many hours spent studying various PC manufacturer advertisements, I took the plunge and decided to replace my old system. I chose an Evesham P3 with, unknowingly, an 'iffy' software modem installed.

Satisfying myself – and then Evesham support– that it was, indeed, the modem and not the BT line or my ISP, that was at fault (that is, very slow downloads and frequent disconnections); the response from Evesham was really good. An engineer was sent within a couple of days, with an upgrade replacement hardware modem which was fitted within minutes.

To cut short a somewhat lengthy tale, I had been concerned about this firm's reputation for customer support, but this turned out to be totally unfounded because the help and technical assistance from Evesham was first class. Anyone thinking of buying from this firm should have no qualms.

L V Woodyer

OUR REPLY: We normally get most of our negative letters aimed at poor customer service so these letters are a welcome change. Well done, Evesham and Viglen!

DavePearman

So, BT thinks it owns the patent on hyperlinks, does it? If there's a bigger own-goal the company could have scored, Dave can't think what it might be...

Apparently, BT came across an obscure patent three years ago, during a 'routine' rummage through its collection of 15,000 such documents. The so-called 'Hidden Page' patent was applied for in 1976, and granted in 1989 in the US, where it remains in force until 2006 – all other territories have lapsed. While the original patent was designed to cover dumb terminals attached to a mainframe, the concepts apply equally – says BT – to the modern equivalent of PCs connected to the Internet. According to Desmond Sargent, the then-GPO employee who registered the patent, it was designed to make people stay on the phone longer – does this sound familiar?

The initial reaction to this story was one of disbelief. "Shouldn't this have been announced on April 1st?" was a common question, closely followed by "They're not serious, are they?" Well, yes, they are. Deadly serious. BT has engaged Scipher – a high-profile outfit specialising in intellectual property cases – to pursue American ISPs for license fees for using 'its' technology. Obviously its current profits of almost £3billion are insufficient.

Putting aside the validity (or otherwise) of the actual claim – and it looks tenuous at best to me – it's hard to see how BT came up with this disastrous course of action. Is the company trying to destroy whatever reputation it has left? Is it really trying to bite the hand that feeds it? Where does BT think it would be today without the massive growth in communications that the Internet has created?

This type of corporate suicide does have a precedent, in the form of the infamous Unisys action over the GIF file format (or, more accurately, the LZW compression used within it). After a similar 'discovery' to the BT one, Unisys pointed out that it owned the rights to this technology, used for graphics all over the Internet, and demanded royalties from CompuServe, then other publishers of graphics software which created GIF files. Like BT, Unisys didn't pursue individual users, but the companies that were using LZW compression in their products. At the time, this action was deeply unpopular with Internet users, though thousands of vendors did eventually sign license agreements, and pay royalties. The discontent still rumbles on, as last year's 'Burn all GIFs Day' showed.

"If the BT Board looked for a way of alienating the entire Internet community, it could hardly have done so in a more damaging fashion"

At least Unisys had a legal (and arguably, moral) right to proceed as it did. After all, the company had actually developed the LZW compression algorithm, a non-trivial project which had been of benefit to Internet users in the form of smaller graphics and faster downloads. While you could argue that the company should have made this claim earlier, before the GIF format had become the de-facto standard for images on the Net, it did at least have some justification for its actions.

Should BT's claim be accepted in the same way, then? No, I don't believe it should. First, the concept of hyperlinks demonstrably pre-dates BT's patent, in the pioneering work of Tim Berners-Lee, Ted Nelson and even Vannevar Bush way back in 1945. While the BT patent may seem to bear some similarity to the modern use of hyperlinks to connect Web pages together, this is little more than a historical coincidence, found in a drawer somewhere, brought out and dusted off in a desperate attempt to make some cash. What's more, it has little chance of doing even that without a long and bitterly-contested legal battle. It's hard to see the likes of AOL rolling over and paying up without a fight, and a DOJ/Microsoft-style brawl looms stormily on the horizon. In any case, ISPs are increasingly managing to distance themselves from responsibility for their users' actions, leaving their liability in cases such as this applying only to their own portal sites, which are hardly likely to generate enough license revenue to pay BT's legal bills.

Just what does BT hope to achieve with all this? If the BT Board sat around the table and looked for a way of alienating the entire Internet community, it could hardly have done so in a more damaging fashion. This ill thought out and misconceived action is rightly seen as the equivalent of cyber-squatting, where unscrupulous individuals register domains in the names of big corporations, in the hope of extracting cash for their return.

There's still time for BT to see sense on this one. The company's Chairman, Sir Iain Vallance, could, even now, pull back from the brink and withdraw the action. The cost of not doing so will be the company's reputation. And in an industry where companies, products and services come, go and are forgotten at a terrifying pace, this is the one thing it cannot afford to lose. A recent press release claimed that "BT Unleashes the Internet". Somehow, "BT Cashes in on the Internet" doesn't have the same ring to it. PCP

Write in!

What do you think? Write and let us know at PCPlus.mailbox.co.uk or to Dave at dave.pearman@futurenet.co.uk or vote on page 33.

MartinBanks

When Windows servers crash in the interconnected world of the near future, shrugging and rebooting just won't cut it anymore, says Martin

I **recently** read an article which suggested that it was, by implication, perfectly acceptable that Microsoft's NT should crash and require a reboot every month or two. Fair enough, I thought, that sounds quite acceptable... and then I came back to the real world.

I suddenly wondered how 'acceptable' such reliability would be in other supposedly serious business systems, such as the telephone. I know we all whinge about BT et al, but a total, terminal departure of the thing every two months? At best? Nah, there would be a lot of unhappy bunnies around, and Government departments would jump up and down making noises, for political effect if nothing else.

But somehow it seems all perfectly acceptable, even for seriously large enterprises – at least part of the target market for NT and its follow-up Windows 2000 – that they should run mission-critical applications on systems where it is acceptable that they die every couple of months or so.

Would you like to phone your bank to hear: "your account? Oh no sir, not any more. The system crashed, you see. We are, however, offering a silver-plated carriage clock for every new account opened. Would you like to open one, sir?"

What is even more intriguing is the fact that the BoyGod is happily predicting that we will all be queuing up for more of the same in future. What is even more galling is that I suspect he may be right. I can't help but feel, however, that he should be wrong, very wrong.

At a recent technology conference in Taiwan, he set out his vision of where the future of computing lay. Not surprisingly, perhaps, the PC still lay at the heart of it.

Okay, the 'PC' he saw was different in form and shape – small tablet-sized systems with built-in speech and cameras are a key part of what he foresees – but it would still be strongly attached to its roots and antecedents. One has to wonder, of course, just what stupendous developments in semiconductor technology Intel and its chums will have to come up with, however. Just think of the resources that are already needed to get a browser and some office productivity tools working; the resources that will be needed to get speech recognition working at real time speeds will be significant. The same goes for real time video with even half-reasonable quality.

"I welcome Bill Gates' vision of the future, for the more he sticks to it, the more he seems doomed to ultimate failure"

Packing all that into a 'tablet'-sized form factor will not be easy. And while it may be doable in purely technical terms, the asbestos-lined pockets we all will need to carry the things around will make many clothes designers unhappy. I'll be intrigued to see how Yves St Laurent or Pierre Cardin cope with making protection for excessive heat dissipation a fashion statement.

Well, the 'tablet' size I can go with, particularly as a business user, but I can't see them as the be all and end all of what we will have. For the vast majority of future 'users', and that means the many millions who are still not the proud owners of a PC, they will be using networked, interoperable, communicating functions that are integrated into the devices they are using. In other words, they won't know that they are using powerful computer systems, they will just achieving their personal 'objectives' – be that watching the latest videos, doing the ironing, or designing skyscrapers.

Business users, and there will be plenty of them, will still need a 'tablet'-sized device of some sort, but I'm not so sure it'll be a 'PC'. I suspect it will be more like the thin clients that are now around. What processing power they have will be geared towards providing the high-performance speech and graphics I/O that will be the front end to whatever applications – or 'functional environment' – the user wants. That environment – which could be old favourite Windows applications if that is where the heart (or dire necessity) truly lies – will be run on big, powerful applications servers.

The 'standards' underpinning all this will be the range of protocols that already help provide the interoperability between systems and applications across the Internet... and the Internet itself, of course. And what is important here is that no one company is going to own the lot.

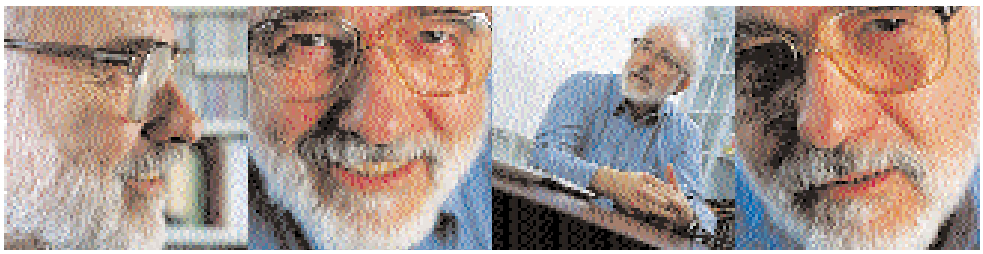
As for the contention put forward by Microsoft supporters that its break up would stifle innovation, the future outlined by the company's Great Leader shows the paucity of such a suggestion. The best he can come up with in terms of 'innovation' is more of the same.

In fact, I welcome the BoyGod's vision of the future, for the more he sticks to that, and sets the corporate controls at a direct and endless fight with the US Department of Justice against breaking the company up, the more it seems doomed to ultimate failure.

Separated out, the operating system and applications elements could be free to become significant players in the development of the type of future systems I see coming. Both, for example, could be freed of their histories to go in new directions. Stuck together, and locked in an endless fight with the US DoJ, their future direction may well be to sink as they miss the boat of what is coming. PCP

Write in!

What do you think? Does the Gates vision excite you or is it more of the same? Is the future of the PC really in your pocket? Write to us at PCPlus.mailbox@futurenet.co.uk or banksie@cix.compulink.co.uk



Chris Bidmead

Is it morally right to download MP3 files? Are you really depriving the artist of a living? Chris discovers there's more to MP3 than meets the eye

I'm told that the key to a snappy column is having a firm point of view. However, MP3s and piracy is a slippery subject and I find it hard to take a stand.

So you won't hear me saying: "Go ahead and rip off CDs – it's only the record sharks you're screwing". That's one point of view, but as a professional writer whose only livelihood is the intellectual property (IP) I generate, you'll excuse me if I don't endorse this wholeheartedly. On the other hand, as we speak I'm listening to a, er, copyright-liberated MP3 of Hole's *Celebrity Skin* that I've just downloaded with Gnapster, the free software Napster work-alike.

What would Hole band-leader Courtney Love think of my act of piracy? We don't have to guess. In a feisty speech to the Digital Hollywood Online Entertainment Conference in New York this Spring she began: "Today I want to talk about piracy and music. What is piracy? Piracy is the act of stealing an artist's work without any intention of paying for it. I'm not talking about Napster-type software. I'm talking about major label recording contracts..."

And she goes on to expose the fraud of the traditional music industry deal, where 'Band X won a $1m record contract' really means they signed up to rent studio time from that same record company for half that amount and are paying most of the rest back to that same record company in the shape of 'promotion fees' and the like.

And these fees are levied on the musicians despite the fact that the contract almost certainly describes the band's artistic contribution as being 'works for hire' in an effort to ensure all copyright falls to the recording company.

There are legal and political issues involved here, but shoving that to one side for the moment, it must be clear to anyone with a reasonably decent PC sound system who has ripped a CD or downloaded an MP3 that the future of music must lie in somewhere this direction: remember how impressed you were the first time you played an audio CD on your Internet-connected PC and found it automatically downloaded the track information from the CD Database at www.cddb.org? But then in the next heartbeat didn't you think, Why just get the track information? The music is just data too, isn't it? Why do I need to shuffle all these silver disks around?

Napster is only the beginning. Home networks of the future will ship compressed audio files around your house from a server where they're catalogued and instantly retrievable. In fact as continuous-on DSL connections become the norm, there's no reason why you shouldn't be able to play any track ever recorded within seconds of deciding you want to hear it.

"Piracy is the act of stealing an artist's work. She's not talking about Napster software. She's talking about record labels"

Half of this revolution is down to the Recording Industry of America (RIAA)-abhorred MP3 format. It's based on a 'lossy' compression technique that squeezes down huge digital audio files from tens of megabytes to a few megabytes so that they're more convenient to ship around the Net and store on your hard drive.

As everybody must know by now, the MP3 tag is an abbreviation for MPEG-1 Layer 3, where Layer 3 is the part that deals with sound, and MPEG stands for Motion Picture Experts Group. MP3 uses some classical data squeezing tactics, but the chief trick is 'psycho-acoustical compression' that throws away large chunks of the sound information that is inaudible to the human ear.

Here's where I slightly part company with Courtney's deeply felt, thoroughly thought through, and – in parts – wildly obscene diatribe (reported in Salon at www.salon.com/tech/feature/2000/06/14/love). She sees 'cruddy-sounding' MP3s as okay for getting an idea of an artist's music, but seems to think you're then going to want to buy the CD to get the real thing. Watch out, Courtney. I hated MP3 when I first heard it but today's larger hard drives and faster processors make compressed bit rates of 128Kbps and above quite feasible, and frankly at 192Kbps (roughly a megabyte-and-a half a minute) I can't tell the difference from CD 90 per cent of the time.

As a matter of fact, MP3 compression is the technology behind my much-prized Arcam Alpha 10 Digital Audio Broadcast (DAB) radio receiver. For my money the clarity, freedom from mush and twitter, and dynamic range beats FM hands down and even has the edge on most CDs. Listen to a live Prom on DAB for an evening and be amazed.

But, as I say, the data format is only half of the story. What the RIAA really fears is the way Napster and later developments like Gnutella decentralise the distribution of music. The AOL/TimeWarner/CompuServe gross-out and the more recent Seagram/CanalPlus/Vivendi engorgement create vast institutions whose goal, like the Roman Empire, is to divert all wealth inwards.

If artists can connect directly to their fans – and I'm with Courtney here – there is simply no need for any of these crapulent colossi.

Whoops! I do seem to be dangerously close to a clear point of view on this subject after all. PCP

Write in!

Have you passed on a buying a CD because you could download an MP3 instead? Is Chris wrong to say it's the future, even if that's the way things are heading? Write in to us at PCPlus.mailbox@futurenet.co.uk or to Chris at bidmead@cix.co.uk

PCPlus HELPDESK

We solve your PC problems

Welcome to the formerly named **Help Screen**! We decided it was time to bring the section name up-to-date: let's be fair, the days of help screens in applications passed a while ago. So welcome to **HelpDesk** instead.

Now just because it's been called **HelpDesk** doesn't mean we plan to ignore all your queries and give you useless but expensive advice – it's just a name change. I'm here to help. So do please send in your questions and I'll do my best to answer them.

We read every question but the ones we print will tend to be those which are most likely to help as wide a range of readers as possible. Please contact me at the addresses below.

Ian Sharpe/HelpDesk Editor
ian.sharpe@futurenet.co.uk

Write in!

E-mail your questions to:
isharpe@futurenet.co.uk

Or write to: HelpDesk, PC Plus
30 Monmouth Street
Bath BA1 2BW

Or fax: 01225 732295

Look out for these icons for useful extra information

FORUM — Visit our forums at **www.pcplus.co.uk** and swap tips with other **PC Plus** readers

PCPlus SEE YOUR SUPER DISC — See our **SuperDiscs** for useful software and extra tutorial files

When you see this, visit the Web site for more information, advice or support

Help us help you!
We get thousands of e-mails a month so do please send your mails to the right department. If you are having CD problems e-mail **support@futurenet.co.uk**.

HARDWARE

Cases and power supplies

Q **I wish to buy a midi tower computer case to build a new 700MHz Athlon PC. What power supply size should I aim for? Has PC Plus reviewed cases recently, or can you recommend one?**
Bruce Walker

A I haven't evaluated any and, as has been pointed out in the **PC Plus** newsgroups recently, this is not an item you generally see tested in the mainstream press. Would you buy a magazine with 'PC case megatest!' emblazoned on the cover? Well yes, I know you would, but there'd be precious little danger of **PC Plus** selling out that month.

For a start, try **http://bxboards.com/case.shtml** where you will find the results of a survey of user opinions on various cases. You should also visit the AMD site **www.amd.com/products/cpg/athlon/index.html.**

Click the 'System configuration info' link. There is a wealth of solid advice here on recommended power supplies, motherboards, cooling solutions and other aspects of construction.

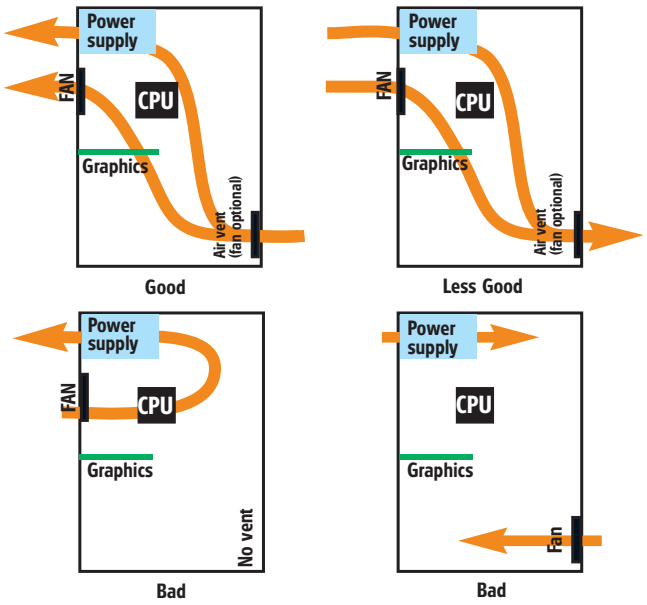
According to AMD, depending on the speed of the processor, 235 – 250Watts is the minimum, with 250W specified elsewhere on the site. This is for a minimally configured PC which means: '128MB RAM, 16MB AGP graphics, internal V90 modem, 10/100 NIC, floppy drive, CD-ROM or DVD, and 5,400RPM hard disk.'

It would be wise to increase that figure if you intend to run a high-end graphics card, multiple drives and fans, and a heap of memory, so 300W is a reasonable target.

This agrees pretty well with **www.pcpowercooling.com/maxpc/index_cases.htm** where there are figures on the power consumed by various components. Tot it up and multiply by 1.5 to estimate the supply rating.

Don't run a power supply near its maximum rating for a sustained period. Some of them aren't up to it and will give erratic output, leading to random crashes and reduced component life. This is one the of the many things that differentiates a poor-quality supply from a good one.

Get the cooling right



↑ **Overclocking is a great way to boost your PC's performance on the cheap but you must ensure you get the cooling right. (See question below). Here's how.**

HARDWARE

Safe CPU temperature

Q **I am about to throw caution to the wind and have a crack at overclocking my Celeron processor. The motherboard has a CPU temperature monitoring function and I can get a read-out from the BIOS set-up screen. Currently it hovers between 28°C and 30°C. What would be the upper limit before I should think of buying extra cooling?**
Ricky Dugdale

A In theory it's quite high – 80°C to 85°C, as best I can tell from the Intel specification sheets.

In practice, operating near the upper limit is going to reduce processor life and increase the risk of instability, especially when transient events such as a combination of hot weather and heavy processing push it higher. Aim for 50°C maximum. Around 40°C is better.

Remember that when you monitor the temperature in the BIOS set-up screen, the CPU isn't working hard and it will run hotter under load. Did your motherboard come with a diagnostic or health-check utility to monitor CPU temperature from Windows? If not, you may have some luck with Motherboard

Reader Tip

Restoring displaced icons

Here's a neat solution to icons gone haywire after switching resolution

Ron Norden's question in issue 165 certainly touched a nerve with many people. Several of you told me about Melissa Nguyen's shareware program EzDesk, available from http://users.aol.com/ezdesk95/. This will automatically detect a change in resolution and offer to put icons back where they were. The registration fee is $15 if you want to use the program after evaluating it. So take your pick – the neat, paid-for solution, or my steam-powered but free answer – and not at all difficult to use, contrary to what some of the EzDesk users were making out.

BEST PRACTICE

Stay cool

Heat kills, so fans must work as a system to give the correct airflow over CPU, graphics card and disk drives

Monitor from **www.t2.net/ace/mbmonitor/** though it's something of a techie's tool and does not support all motherboards.

Here are some measures you can take if cooling is a problem:

- Use software which forces the CPU to wind down during idle moments, and therefore run cooler. Examples are Waterfall, CPUidle and Rain. There is a detailed comparison between these at **www-student.informatik.uni-bonn.de/~canavan/wateridle0.html.** Go to **www.benchtest.com** for another take on the subject. Find the downloads at **www.processor.org/files.htm.**
- Get a beefier CPU fan and heatsink.
- Apply a very thin layer of thermal paste (not thermal grease) between the CPU and heat sink. Remove any glue first. This works well. You can get the compound from sellers of electronic components and some of the PC bits vendors, for example **www.overclockers.co.uk** which has a range of cooling solutions and PC cases designed to thrill fan fetishists everywhere.
- Assess the airflow in your case and fit an extra fan if necessary. Read **http://support.intel.com/support/processors/thermal/system.htm** which is Intel's general recommendations on thermal management and deals with airflow issues.

Going off at a slight tangent, there was some debate in the **PC Plus** newsgroups a while back over whether the case fan should suck air in or blow it out. The contention was that if the power supply fan sucks air in at the top, as it does in some computers, this goes against the natural tendency of hot air to rise and is therefore inefficient.

We doubt it matters much for that reason alone, because the fan will easily win out. The fact that the air is being warmed by the power supply on its way in will almost certainly reduce the cooling effect, however.

The ideal is for fans at the top rear of the case to expel air, and for an inlet at the bottom front to provide the main entry point. This can be fan-assisted for greater effect, but must suck air into the case to provide a through flow.

If you had two fans close together working in opposite directions, or a fan working near a hole in the case, most of the air circulation will be local, leading to static air and possible hot spots further away. If you have more than one fan and all blow inwards or outwards, then you aren't getting a good flow.

You can check which way your fans blow by cutting a very thin strip of paper and dangling it nearby, being careful not to let it be sucked in! The diagrams illustrate some good and bad cooling scenarios.

NETWORKING

Switch or hub?

Q I am about to upgrade and expand my small office network and have it in mind to buy a hub. Reading around the adverts, it is hinted that switches are now cheap enough that I shouldn't even consider a hub. My problem is that I know what a hub does, but haven't a clue what a switch is and why it should be better! Your advice would be greatly appreciated.
Mark Baty

A They do the same job but in different ways. For the benefit of other readers, I should explain a little background. A simple Ethernet network has all the computers daisy-chained together. If there is a connection problem at any point, the entire network goes down. Also, the computers all share the available bandwidth: when there's a lot of traffic, they compete for capacity and performance deteriorates.

With a hub installed, the network topology changes from a line to a star, with the hub at the centre and computers on the legs. If one leg of the star breaks because of a cabling problem, the rest of the network still functions.

A hub does its job in the simplest way possible. A network packet arriving on one port is presented on all the others. The hub doesn't know which leg of the star the recipient is located, so it broadcasts everything it receives.

This can degrade performance because the network has a maximum data throughput capacity known as the bandwidth. All those packets on ports where they aren't needed soaks up bandwidth unnecessarily.

Switches in action

Switches are more intelligent – they know the address of each device on the network, and direct a packet to the correct port only. The advantage is better performance because the bandwidth on each port isn't partly soaked up by packets that don't need to be there. The system is also more resistant to performance degradation when certain problems arise.

It's true that the price differential between hubs and switches is smaller than it has ever been before. It isn't negligible, though, and a small or lightly loaded network won't see a significant performance advantage from the extra spend. Consider it if you are doing heavy data transfers such as loading big files or lots of printing, or your network is heading towards a lot of users or a multi-server scenario.

Getting it right

To make the right decision you need to analyse your proposed network layout in terms of how much traffic there is likely to be on different parts of it, the impact of problems and future expansion plans.

Consider alternative topologies to see if this will improve bottlenecks and reliability, and perhaps reduce your overall spend. At **www.wown.com/j_helmig/switch.htm** you find a good intro to the basics, illustrated with some nice animated diagrams.

BIOS

AGP aperture size

Q Please could you explain what 'AGP aperture' means? I can see this option in my BIOS set-up screen. It is set to 64MB but other options are available. I know it must have something to do with the graphics adaptor. What is the best setting and why?
Colin Whittle

A Video adaptors have their own on-board memory in which the screen image and other information such as textures are stored. Video memory is expensive, so AGP devices can annexe part of the main system memory to store textures.

This memory isn't necessarily in a single block – it can be assembled from 4K memory pages scattered around the PC's memory map. However, the AGP adaptor sees it all as a single block – in other words, the memory has a contiguous set of addresses.

The maximum block size is set by the AGP aperture value in the BIOS. There is no universally correct setting. By default it's usually set to 64MB, but individual adaptors may require something different.

So the information should come from the manufacturer but even then, the advice can be vague.

For example Matrox and Guillemot both say: "Half of your total amount of main system RAM, however you should try different settings" while Creative says: "The Banshee does not require a specific AGP aperture setting."

Dig through the help file and try the manufacturer's Web site, but don't worry if you can't find anything – it's not worth fretting over if you aren't experiencing problems relating to 3D programs.

E-MAIL

Switching to Becky

Q I have an e-mail program called Becky and use it in preference to Outlook Express, which I have uninstalled. I do not have a Hotmail account. Whenever I click on 'contact us' or 'e-mail me' on a Web site I get the error message 'no program is registered to send e-mail.'

In Tools/ Internet Options / Programs, Hotmail is listed as my program choice for e-mail. I have tried to change it to Becky

but cannot do this. Can you help me please?
Alan Roscoe

A Here are instructions I adapted from some I found at the Becky support site **www.becky-users.morelerbe.com)**

- Run Windows Explorer (not Internet Explorer).
- Select View / Folder Options.
- Select File Types.
- Select 'URL:Mail To Protocol' and click Edit.
- Select Open in the Action list and click Edit.
- Type Becky's full path into the 'Application used to perform action' field, for example C:\Program Files\RimArts\Rebecca\Rebecca.exe.

Users of other e-mail programs should try a similar tack.

Becky's (or, more properly, Rebecca's) author is RimArts, and can be found at **www.rimarts.co.jp.**

INTERNET

Web site feedback

Q In the May issue (163) on page 186, there is a letter regarding Web site form feedback coming through as an e-mail attachment. Your solution of a VB macro in Outlook is possibly overkill. Adding the following to the form tag on the site will do the trick:

```
ENCTYPE=text/plain
```

The form tag overall looks like this:

```
<FORM method="POST"
action="mailto:myemail@
myisp.com"
ENCTYPE="text/plain">
```

The e-mail data should then come through in the body of the message without the extra characters.
Niall Kearns Mills

A The words sledgehammer and nut come to mind. It was a useful excursion into Outlook programming but you're right – this method is far easier. I knocked up a demo form and put it on the **SuperDisc** – double-click **\handson\files\helpscrn\formtest.htm.** You need to edit your e-mail address into the HTML so that the message is sent to the right place.

PCPlus SEE YOUR SUPER DISC

EXCEL

Listing unique items

Q If I have a list of items in a column in Excel, how do I generate another list containing one instance of every item that appears in the first list? To put it another way, if column A contains Jim, Joe, Joe, Susan, Joe, Jim, Susan, how do I derive the list Jim, Joe, Susan?
Landon Hughes

A There are several ways – pick the one which works best for you:

- Copy the list to another column. Sort it into order. Each person's entries will fall together. Delete repeated entries, leaving one of each. Sort into order again, so all the blank cells drop out leaving the entries together.
- Two more methods are listed in Microsoft Knowledge base article Q110141 **http://support.microsoft.com/support/kb/articles/Q110/1/41.asp)**. One is too long to explain here. The other's fairly straightforward. Suppose your list is in A2:A21. Find another column of blank cells of the same height. Let's say it's B2:21. Enter this formula into B2:

```
=IF(SUM((A2=$B$1:B1)*1)=0,A
2,"")
```

Don't press [Return]/[Enter]! This is an array formula, so must be input with [Ctrl][Shift][Enter].

Do the same if you edit the formula. Excel will put curly brackets around it to indicate that it's an array formula.

Copy the formula down as far as B21. The quick way is to double-click the small black square on the bottom right of the cell border when it is selected.

This will give you a list with gaps between entries. You can copy and paste this, using Paste Special to paste values only. Sort the pasted

Original list	Unique
Joe	Joe
Bert	Bert
Joe	
Robert	Robert
Bert	
Jim	Jim
Jim	
Julie	Julie
Joe	
Julie	
Susan	Susan
Jim	
Joe	
Julie	
Stewart	Stewart
Eric	Eric
Robert	
Robert	
Susan	
Stewart	
Randomise list order	

↑One way to produce a list of unique entries in column A is to use that mysterious beast, the array formula.

version to get rid of the blanks.

- Trawling the newsgroups I found an alternative which omits the blanks between entries.

If you want to follow up on that and don't mind coming face to face with a grisly-looking formula, go to **www.deja.com/home_ps.shtml** and type in 'Excel short formula Leo' without quotes.

The list of messages returned includes posts by Leo Heuser which discuss this.

BEST PRACTICE

Excel trickery

Excel and some other spreadsheets have an under-used but very powerful feature

An array formula applies the same formula to a range of cells, and remembers the result of each calculation. The results can be accumulated into a summary.

For example, type some numbers into cells A1:A10 and make sure some of them repeat. Now enter this in C1, being sure to press [Ctrl][Shift][Enter] afterwards:

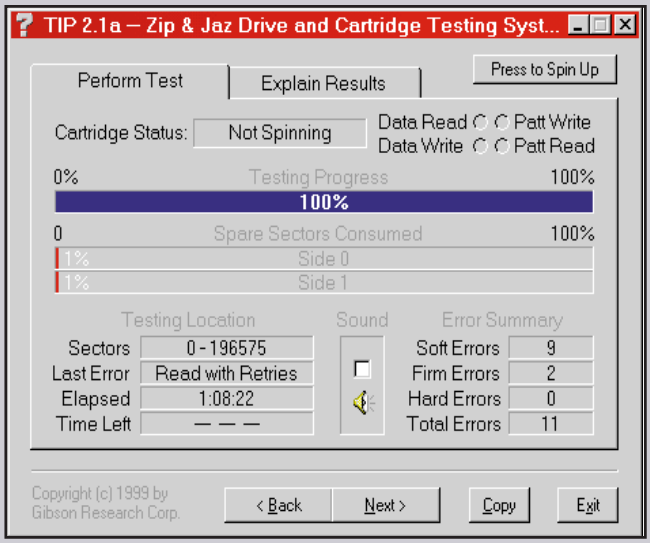
```
=SUM(IF(A1:A10=B1,1,0))
```

You should see the formula enclosed in braces and '0' in C1. Now enter a number into B1. C1 will count the number of times it appears in the list. The key to this is the range A1:A10 in the IF() test. Since this is an array formula, Excel runs through each cell in the range, comparing it with B1. When the list entry is equal to the number in B1, it returns 1. If they aren't equal, 0 is returned instead. The string of zeros and ones is seen by SUM(), which . accordingly sums them up.

Reader Tip

Iomega check-ups

Got a Zip Drive with problems? Fix them like so:



↑See what sort of shape your Zip drive and disks are in with this free download from Steve Gibson.

If you own a good old Iomega Zip drive, you may be interested in a utility which gives it a thorough health test and check, and can fix some cartridges damaged by a particular problem.

TIP (Trouble In Paradise) is available from the Free Stuff section of http://grc.com. Be sure to read the introductory text within the program which has important information you should know before running it.

The text explains the 'Click of death' phenomenon. There is also a Click of Death resource page at this site. Note that TIP does not work with non-ATAPI internal IDE drives. This doesn't mean all IDE Zips, just early ones. The differences are explained at a site called 'Coping with Zip and Jaz drives' at http://pw2.netcom.com/~deepone/zipjaz/index.html which has a useful FAQ and links.

If you're in a fix over a dead Zip drive, of the many Zip-related sites around, www.accesszone.com/clickdeath/index.html may prove the most helpful in an emergency if you are ready to try warranty-voiding surgery.

WORD

Swedish spelling checks

Q I am using NT4 Workstation and Word 97 which I want to use in more than one language. I have a keyboard with a Swedish layout, with my default language set to English (this seems to be the only way to keep the English spell checker working). I would like to get a dictionary for Swedish, but have no idea how to go about it. So far all I have got is frustrated when searching the Microsoft Web site. If I don't have to pay for it, all the better!

I have found that setting the language, through Tools, Language, Set Language to Swedish just seems to disable all spell checking.

Scott Ballentyne

A I don't know of a free option. Microsoft's recommendation (Knowledge Base article Q186037) for Swedish and many other languages is to buy the required software from **http://proofing.com**. A Swedish dictionary for Word 97 is available for about $77 and can be downloaded or ordered on CD.

SCANNERS

Scanning slides

Q Some time ago I bought a low-cost flatbed scanner to muck around with. Like most cheapies, it did not come with a transparency adaptor. I decided to tinker with some home-brew solutions with a fair degree of success – basically duplicating the commercial adaptors whereby you shine a light through a diffuser placed behind the slide. I then found Don Maxwell's Web page at **www.abstractconcreteworks.com/essays/scanning/scanning.html** where he gives details of his experiments along similar lines.

Don also has a neat alternative solution which is easy to make. I tried it and the results are remarkably good for a bit of folded cardboard!

Basically, it involves making a short tent very similar in shape to a sandwich carton. This sits on top of the scanner glass, covering the slide. When scanned, enough light gets up behind the subject to bounce off the inner tent walls and shine back down through the picture. Please do pass this on to your readers.

Paul Seeley

A I had a go and was surprised at the results. The initial scan looked dim but my photo editor's auto-fix tools soon sorted that out. Because initial light levels are low, gaps between similar colours are widened in the corrected version and any noise is amplified. The result is a speckled effect when you zoom in.

Software can smooth this to some extent, but there is no substitute for getting a better scan. This means getting more light on to the white background. There seems to be plenty of scope for experimentation with the shape.

Results weren't so clever with colour negatives, even after software had inverted them and adjusted brightness and contrast. Converting images to black and white improved results dramatically.

Slides and the scanner glass must be scrupulously clean – you are scanning at high resolution to get a good level of detail from a small source.

↑ Sorry folks, it's the only transparency I had to hand. Not bad results for a standard flatbed scanner, some origami and a photo editor's automatic light level adjustment.

PAINT SHOP PRO

Colour correction in Paint Shop Pro 6

Reader Doug Jackson has a problem with under-exposure...

Q Could you advise me on what to do with the scan of a problem photo? The sky is about right, but everything else is very under-exposed.

Doug Jackson

A In a darkroom you could use a technique called dodging to lighten specific areas of an image. The reverse effect is burning, which darkens. What you want to do is dodge the darker parts of the photo.

Here's the plan, then: we take a copy of the image and process it in such a way that it becomes a map of the light intensities of all the pixels. We then get PSP to dodge the entire image, but to vary the degree of dodging according to a pixel's entry in the brightness map. If a pixel is bright, don't dodge it much. If it's dark, dodge it a lot.

This can be done quickly and to good effect, but don't expect miracles. An under-exposed photo has its colour values compressed towards the dark end of the scale. When you lighten it up, you can't create new steps between those values. The gaps just widen. Dodging the image won't change that, so detail will have been lost.

Noise annoys

Also, scanner electronics have inherent noise – the circuitry introduces random variations, like the hiss you get when you turn up the volume on an amplifier when nothing's playing. And like turning up the volume, dodging an area will amplify the noise. This will show up as a speckled effect.

Scanners with the same specification on paper are not created equal. An expensive scanner with low-noise electronics and more bits per pixel will yield images that respond better to retouching than ones from a lower quality unit.

It helps if you don't save your scanned image as a JPEG – this is a lossy format which introduces noise and compresses subtlety out of existence, in addition to the scanner's contribution.

This may not matter much if the scan needs no work, but when heavy processing is required it makes a big difference to the end product. Convert to JPEG after processing.

Heavy processing

Here's what to do. Select and copy the entire image. Paste it as a new image. On the Colours menu pick Grey Scale. This converts the copied image to monochrome – effectively a map of light intensities in the picture. Next, convert the picture to a negative image (Colours menu again). The reason for this will be seen in a moment.

Select the entire negative image, copy it, and move back to the coloured original. Paste it, opting for Paste As New Layer. What you have now is an image with two layers, one directly on top of the other. The original image is behind, so you only see the negative.

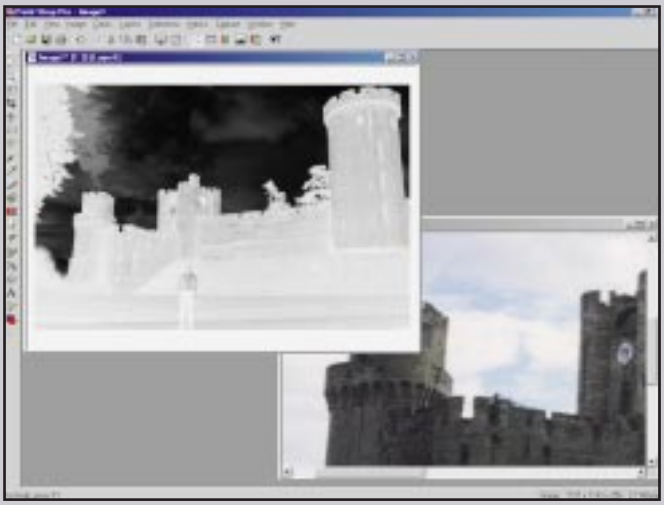
Right-click in a toolbar and select Layer Palette. In the Layer Palette dialog you can see both layers along with some controls. Layer 1 is the pasted negative; Background is the original image.

To the right of Layer 1 is a field which says Normal. Change it to Dodge. To the left of it is the Layer Opacity slider. Drag it leftwards to get the best overall effect.

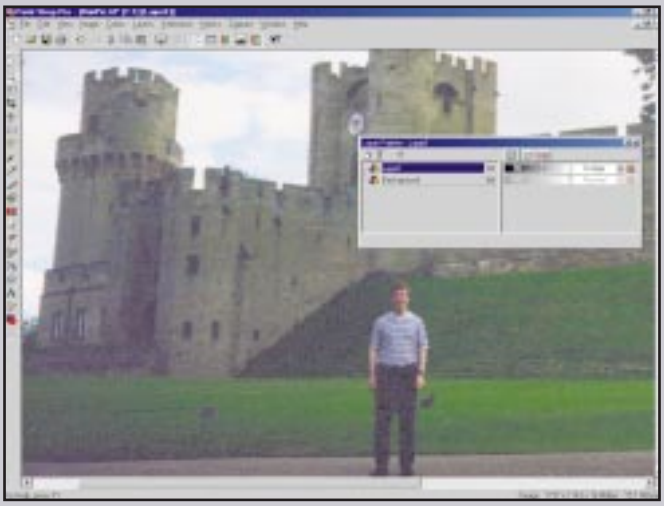
What's happened here is this: with the negative layer's blend mode set to dodge, its contribution to the image is to control the degree of dodging on each pixel. Dark pixels in the original became light in the negative. These apply a high level of dodging. Light pixels in the original became dark in the negative, and cause minimal dodging. Changing the layer's opacity controls its overall influence on the image – anywhere between no effect at all, to far too much. Between a third and half way up the scale is likely to be about right.

There will probably be areas which still aren't at their best –

1 Clear as mud! It was a nice day at Warwick castle, but this photo is perfectly exposed for the sky leaving it under-exposed everywhere else.



2 I made a copy of the image in PSP and converted it to a monochrome negative. This becomes a mask in the next part of the process.

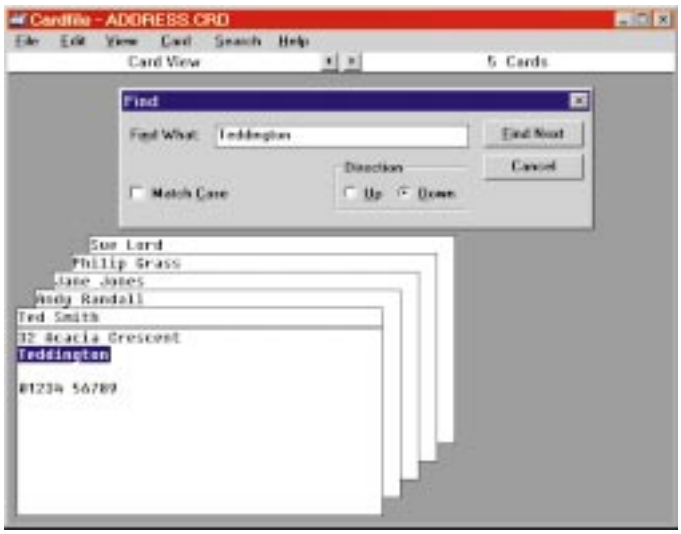


3 The picture improves after setting the negative layer to dodge blending mode and reducing its opacity, followed by minimal hand retouching.

either too light or too dark. Select the Retouch tool on the left hand side. It's the icon with the white hand and pointing finger. Right-click in a toolbar and bring up the Tool Options dialog. On the second tab change the retouch mode to Dodge (to lighten areas) or Burn (to darken). On the first tab you will probably find it helps to reduce the tool's opacity – say to 50 per cent – and its size. You can now zoom right in and carefully touch up selected areas.

Windows Support

Don't let Microsoft beat you. Get your back-up here...



↑ This golden oldie never died, it just faded into obscurity in a backwater of the Windows 98 CD-ROM.

WINDOWS

USB + Win95 = no go

Q In Issue 161, (March 2000 p122) there was a review of the Wacom Graphire USB. I thought 'Ideal' – I had just discovered two USB connectors on the motherboard, and I am fed up with having to keep replacing my mouse. I also wanted to do more graphics work, so I went and had a look at the PDF file on Wacom's site. It insisted on upwards of Win98, so I contacted the company and got the following reply: "The USB interface in Windows 95 doesn't support the HID driver. If you want work with a USB tablet you must install Windows 98 or Windows 2000."

What are they talking about? Do you know of any way around this?

Jo Heyes

A HID stands for Human Interface Device. In order to be recognised by Windows, USB input devices such as the Wacom must have a driver written to the Windows HID specification. The original Win95 did not support USB at all. Win95 OSR2.1 and 2.5 had limited support for it; Win98 and Wind2000 have full support. If you want USB, you really need to run Win98 or Win2000. If you're keen on the Graphire but don't want to buy a new operating system, there is a serial port version of the device which is compatible with Windows 95, 98 and NT.

WINDOWS

Cardfile lives!

Q Does anybody remember Cardfile, that ultra-handy little card index program that shipped with Windows 3? To my amazement, I found it is alive and kicking on the Windows 98 CD. Run System File Checker (enter Sfc.exe into the Start / Run dialog). Select 'Extract one file from installation disk'. Enter 'cardfile.exe' and click Start. In the Restore›From box, type the drive letter and path to the Windows 98 source folder on

the CD – ‹drive letter›:\win98. Click OK and the program should install on to your hard drive. You can now type cardfile.exe into the Start / Run dialog.
Frank Joseph

A The snag being that good old Microsoft omitted the help file. Fortunately Cardfile is easy to use, being just like a physical card index. Just double-click the empty heading line to enter the index text. Click within the body of the card to enter freeform text. You can also paste graphics from the clipboard after selecting Picture on the Edit menu. Flip it back to text mode before typing again. Apart from that, the menus are virtually self-explanatory. The popularity of the intuitively simple Cardfile spawned countless clones, as a scan through any decent shareware/freeware site will reveal. For example go to **www.jumbo.com** and type 'Cardfile' into the search field.

WINDOWS

Scanreg found wanting?

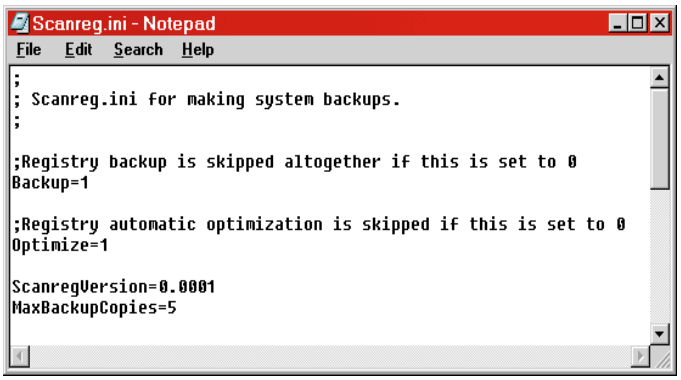
Q I see that Windows Registry Checker (Scanreg) in Windows 98 automatically keeps a backup of the registry for the last five successful boot-ups.

It strikes me that while this is better than nothing, the system could easily be found wanting.

What happens if my registry develops a problem which isn't immediately apparent – maybe because I don't use a particular feature every day.

By the time the problem comes to light, it might have propagated throughout the back-up set.

Is there a way to modify Scanreg's operation to reduce this risk?
Jim Kenny



↑ This INI file can be edited in Notepad and controls Scanreg's behaviour.

A You're not quite right on this. Scanreg does run automatically whenever you start Windows 98 and, as you say, makes a copy of the registry after a successful boot – but only on the first occasion every day. Unfortunately you can spend the whole of the day rebooting and it won't take another copy until the clock strikes 12.

The last five copies are kept in CAB files in Windows\Sysbckup. There is a configuration file for Scanreg, \Windows\Scanreg.ini, with which you can modify Scanreg's behaviour.

Full details are in the Windows 98 Resource Kit – just type "scanreg.ini" into the Search field, including the double-quotes – as is information about command line switches.

If you want to extend your registry backup timeframe, change the 'MaxBackupCopies=' value in Scanreg.ini. You can edit the file with Notepad.

The Sredit.exe configuration tool I sometimes see mentioned is only included with the full Windows Resource Kit you have to pay for, not the sampler included on the Windows CD-ROM.

Reader Tip

Kill clutter

Hello from Sweden! Here is a handy tip for your readers with cluttered desktops. Start the Paint accessory. Under Image / Attributes change the image size to the same as your desktop – 800 x 600 for me.

Paint some filled rectangles to divide the screen into sections where you will keep different types of icon such as document links, Web links, current work, program shortcuts, and so on. Put a text label on each one. Save the file and make it your wallpaper. Hey presto!... a Cubist desktop that helps keep your icons in order.
Lars Almqvist

WINDOWS

PCPlus SUPER DISC PATH: \prog\files\helpscrn

Speed tweak

Q Some time back you advised that system performance is improved if the Windows swap file is given a partition of its own at the start of a second (fast) disk drive.

I have used this ever since and it does make a significant difference when the Windows partition gets large and full.

I got to thinking that the idea can usefully be extended to ensuring that temporary files are also relocated on to the swap file partition.

This is very easy to arrange: open up C:\Autoexec.bat in Notepad, and either create the following line or modify the one already there:

```
set temp=d:\temp
```

where 'd:' is the drive letter of the partition where your swap file lives.

It is important to now create a 'temp' folder on this drive. There must also be a fair amount of free space. I have a partition with a 200MB fixed-size swap file and 100MB left free for the rest.

Any idea how the printer spool file could be moved there, too?
Andy Stockton

A The spool file lives in \windows\spool\printers. The \spool\printers part is hard-wired into the file Gdi.exe, which is the heart of Windows' graphical display system. There's no point trying to hack this with a hex editor because Windows will prefix the path with the location of the Windows folder.

WINDOWS

Thumbnail views

Q I have just received the July issue of **PC Plus** and notice that you answer a question concerning the thumbnail view failing.

This has happened to me more than once and I have always found that the method described in Microsoft Knowledge Base article Q192573 solves the problem quickly and easily.
James Cockburn

DELVING DEEPER

Troubleshooting Win98

In last month's Windows 98 troubleshooting feature lack of space forced me to leave out a really good tip...

Suppose you are using Win98's System Configuration Utility (Msconfig.exe) to find out which of several programs loaded at start-up is causing a problem. This may be something auto-dialling your ISP, or crashing the machine or whatever. On the Startup tab you can disable selected programs, and thereby home in on the culprit over successive reboots.

The trouble is, on a ripe old Windows installation you could have 30 or 40 programs listed. You may be lucky and happen on the errant program very early on. There again, it might be the last one you try. The average would be half as many reboots as there are programs.

Quicker solution

There is a way to find the errant program much quicker. On a list of 40 candidates, you will locate the problem in 6 tries guaranteed, assuming only one program is at fault. If more than one program is faulty, then this method will fail. Programmers will be no stranger to this standard technique, called a binary search. Non-programmers may not know it, so here's how to find 'program X'.

It helps if you first print a list of the programs on Msconfig's Startup tab. Do this by first dragging the window to the full height of the screen. Press [Print Scrn]. Open Paint from the Accessories section of Start / Programs. Paste the image into it and print. Repeat after scrolling the list, if needed.

The print-out is useful because once you start disabling items and rebooting, their positions may change. Keep track of where you're up to by marking the printouts.

- Disable half the most recently enabled programs (at the start this just means disable half the programs).
- Reboot.
- Problem appears: program X is in the newly enabled section.

Problem absent: program X is in the disabled section of the current sub-set – enable half the programs you disabled in the previous step.

You will quickly isolate the program because you are progressively halving the list of candidates. The number of iterations required is a power of two – four programs will take two reboots. Forty programs take only six. You'll find that the longer the list, the bigger the benefit.

↑ This is what the registry key should look like when you're fixing broken thumbnails in Windows Explorer.

A One of several such messages. I wondered how I'd managed to miss Q192573 until I noticed that it deals with a failed preview on the bottom left of the Explorer window. For the July answer I used Knowledge Base article Q178746 which deals with thumbnail view, where the icons for picture files in the right-hand pane are replaced by small versions of the images they contain. This is what the questioner was having trouble with.

The July answer only takes a moment to try. If it doesn't work or your problem is with the preview, then have a go with this. Back up your registry first and make sure you know how to restore it, or risk eternal damnation!

Run Regedit.exe (Regedit32.exe in NT). Verify that the following entries exist in the HKEY_CLASSES_ROOT\‹file type› registry key for the type of file you are trying to preview:

Key: HKEY_CLASSES_ROOT\‹file type›\ShellEx
Key: HKEY_CLASSES_ROOT\‹file type›\ShellEx\{BB2E617C-0920-11d1-9A0B-00C04FC2D6C1}
String value: (Default)="{7376D660-C583-11d0-A3A5-00C04FD706EC}"

See the screen grab if that sounds just a bit too scary – it's simple enough as long as you don't mistype the strings. I have put them in the text file Thumbstrings.txt on the **SuperDisc,** so you can copy and paste. According to the Knowledge Base article, the following file types use those registry values: .art; .bmp; .dib; .gif; .jfif; .jpe; .jpeg; .jpg; .png; .wmf.

WINDOWS

PCPlus SUPER DISC **PATH:** \prog\files\helpscrn\script

Unattended backups

Q In **Home Networking Masterclass** from **PC Plus** June 2000 (page 190), it is stated that it is possible to schedule Win98 to do unattended backups '...in the middle of the night...'. I have never managed to get Win98 backup to do this without user input for the several prompts. I do note however, that the article only hints at, while not quite explicitly saying it is unattended.
Andrew Joseph

A In Windows 98, MS Backup can be started automatically with Task Scheduler but it won't do anything more. It needs you to be there to click its buttons. Microsoft's considered advice is to buy another backup program!

My advice, if you are otherwise happy with MS Backup, is to leave your credit card alone and use one of the many free Windows automation tools.

Picking a random example from the Freeware section of **www.nonags.com**, Gary Rumble's Windows Script (from **www.teleport.com/~garumble/windows.shtml**) is simple and small and can easily do what you want. I have put a copy on the **SuperDisc**.

Just to prove that Windows Script is up to the task in hand, I wrote a sample script to drive MS Backup. It's designed to execute a backup set called Test and is in the file Backup.scr. This is plain text and can be edited with Notepad. Note that it is just a sample – if your backup job is configured differently to mine, there may be extra prompts which will cause the script to stop in its tracks.

Use Notepad's Search and Replace function to change all instances of 'test' to the name of your own backup job. Every line is annotated so you can understand how it works. The command line would be:

```
C:\Program Files\script\script.exe backup.scr
```

– assuming you placed the Script folder in \Program Files and that Backup.scr is in the same folder. You could make a shortcut for this command, and get Task Scheduler to run that. Note that the script contains no error checking.

DELVING DEEPER

Scripting Windows

What do you do when you want to automate tasks?

Recorder passed away in 1995, but Microsoft has been keeping quiet about an easy way to automate Windows.

I found an interesting nugget of information on the scripting front. Ever since Windows 3 sank beneath the waves taking Recorder with it, we haven't had a simple automation tool included with the Win9x line of operating systems. Yes, I know about the Windows Scripting Host but for non-programmers it's a great galumphing pig of a thing to use and no general-purpose Recorder substitute.

I just discovered that Microsoft has had a nice little scripting tool up its corporate sleeve for more than two years. ScriptIt was an enhancement for NT Server, but it'd be a boon down here among us plebs. Maybe it'll crop up in a desktop operating system one of these days.

You can get a copy from **www.microsoft.com/NTServer/nts/deployment/custguide/scriptit3.asp** or if MS has moved it by the time you read this, try **http://cwashington.netreach.net/main_site/downloads** and page down a bit.

The download unpacks Scriptit.exe and a document which tells you all about it. Here's a script to run Calculator, work out 2*2 and put the result on the Clipboard:

```
[SCRIPT]
run=calc.exe
Calculator=2*2=^c
```

In the third line, the window entitled 'Calculator' is sent the keystrokes '2*2=' followed by [Ctrl][C]. Easy! This next fragment begins a backup session:

```
[SCRIPT]
run=msbackup.exe
Microsoft Backup=~winwaitactive#!o{ENTER}
Open Backup Job=~winwaitactive#Test{ENTER}
~Microsoft Backup=~wait#!s
```

Read the documentation and you'll find it's simpler than it looks. I'll leave it to you to finish off.

→ Further help resources

How to get information direct from manufacturers and fellow users

If you need an updated driver or other help direct from a manufacturer, see if it has a Web site. One of the search engines will help you locate it – for example **www.hotbot.com, www.excite.com or www.av.com**.

I have compiled a list of Internet addresses of many leading hardware and software manufacturers. It is in the file hdnet.htm which you will find on the **SuperDisc** every month.

If what you want isn't there and the general search engines turn irrelevant links, try **www.service911.com/content/SupportHelp.asp** which has a searchable database of tech support contacts. If you find a site I haven't listed, but which could be useful to other readers, drop me a line at **i.sharpe@futurenet.co.uk**.

Newsgroups are also a great source of help and advice. It is likely that your question has been asked and answered before, so before posting a message search previous postings at **www.deja.com**. And don't forget **PC Plus**' own newsgroups at **www.pcplus.co.uk**.

PCPlus

MAILBOX

This month: The Dre vs Napster debate, ADSL and fast PCs, censorship on the Net and one reader's love affair with Microsoft

Dre vs Napster

In your 'Welcome' editorial in the July 2000 issue, you talk about the MP3 issue and discuss Dr Dre's involvement. However, I feel that you made a number of unfair statements in the article.

You state Dre, "was not above a loose attitude to the law when it suited his own lyrical purposes." I think that what you mean here, is that the music that NWA made described violent and illegal acts. Making music which tells a story is one thing; actually breaking the law is quite another. I doubt you would accuse Charles Bronson of being a vigilante. The music of NWA was violent but, in my opinion, perfectly valid social commentary.

Likening sampling to MP3 trading is also very unfair. The point of sampling is to take a small section of another record (which in the early days hip hop artists could not hope to reproduce with their limited equipment) and turn it into a completely new sound.

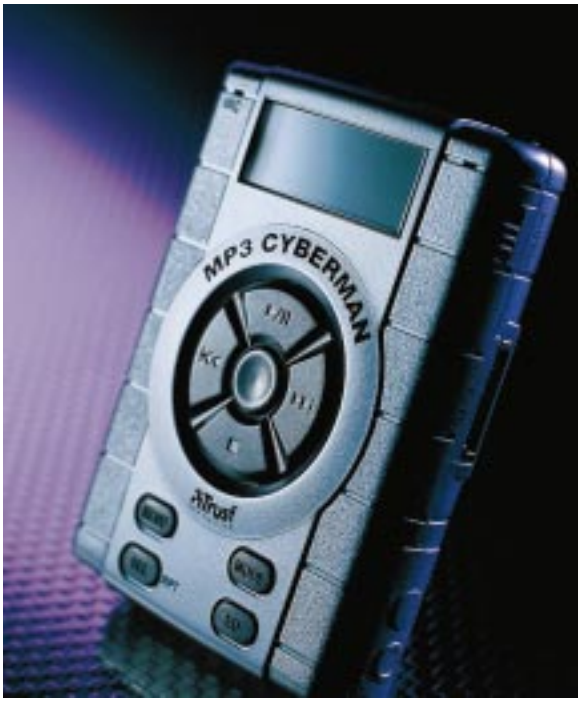
You made some interesting and valid points in your article, but I was disappointed that you felt the need to be so inaccurate about one of the most talented musicians of the 80s and 90s. Oh, and ever heard of 'Metallica'..? Wonder why they were not mentioned..?

However, there was one thing about your article that made me happy: **PC Plus** is a cracking good read. From the tone and the logic of your article, I don't think it will be too long before I will not have to pay for **PC Plus** in the shops any more – I will simply load up 'Pluster' and get a copy from somebody.

James Ingram, via e-mail

NICK'S REPLY: Rap may be social commentary, although it's interesting that Dre himself now prefers to avoid making such elevated claims for it – he's been quoted as regarding his music as entertainment and little more.

My point was straightforward: rap came from the underground, was propelled by a bunch of talented entrepreneurs, and ended up subverting and changing music. And now a few who benefitted from this process are trying to stop the next generation doing something similar. Call it what you like, but I think it's rank hypocrisy (or hip-hopcrisy?).



↑The debate over the implications MP3 has for the music business – and beyond – continues.

Many musicians disagree with the stance on MP3 trading taken by Dre – Public Enemy and Courtney Love being two. And I didn't mention Metallica because I didn't need to – their own fans are doing a fine enough job of making them look like idiots, thanks to Napster clones like Metallicster.

Napster – or software like it – is here to stay, as evidenced by the development of Gnutella and FreeNet. www.gnutellanews.com **There's going to be much more stuff hitting the fan in this way when we all go broadband. Suing your own customers isn't the way to deal with it. The answer is to do what proto-rappers did when forced by economic circumstances to make music in a certain kind of way – innovate and change the rules.**

Free speech, not free beer

I was reading your 'Welcome' editorial in the recent issue of **PC Plus**, and you wrote: "The Internet is a testament to building things by giving stuff away, and the whole Linux revolution is based on giving software away, too".

I suggest you read one more time the GNU blurb about the difference between FREE as in free speech and FREE as in free beer. (Like for example www.gnu.org/philosophy/words-to-avoid.html)

As for the Naspster problem, as a lot of people have already pointed out, what if I scan **PC Plus** and put it on the Web via Napster. Would you find that 'innovating'?

Jm, via e-mail

NICK'S REPLY: Without free e-mail protocols developed by Eric Raymond, the free HTML standard developed by Tim-Berners-Lee and God knows how many other key free standards, the Internet would not be what it is today. We can't think of a clearer example of the virtues of building things by giving stuff away, than the Web.

We already put a lot of PC Plus material up in the Web for free. And analysts like Esther Dyson have talked in some detail about how it's possible to innovate your way around the problem of giving stuff away for free (read her book Release 2.0 for full details). There are solutions – and suing your customers is one selected only by the most bone-headed.

Linux fragmentation

With regards to the news article 'Fragmentation could hinder Linux growth' in issue 165, it seems that the analysts mentioned in the article fail to understand that most of the software being written for Linux, especially by open source developers, is not being written for particular distributions of the operating system but, for example, a particular window manager such as Gnome or KDE. I would also imagine that developers would not want to write software for one distribution and then change it for another.

As with open source software, many Linux users will choose to get their hands dirty and install a piece of software from its source code.

The Red Hat Package manager has been incorporated into many distributions of Linux and, where possible, distributors of software binaries will do so in both RPM form and the S.u.S.E package form.

I think that it a positive thing that more corporations wish to develop for the

Linux platform but it really is not their place to define its direction with a threat of incompatibility between distributions.
Richard Grantham, via e-mail

NICK'S REPLY Let's hope you're right – the Unix experience does mitigate against it somewhat, though.

Group Efforts

Words cannot express my delight at the return of 'Group Efforts' albeit that it is restricted to the Web site. As a magazine subscriber for longer than 'GE' ran I was more than distressed at the sudden disappearance of the feature that was always the first to be read when the monthly mag dropped thru' the letter box.
Vic Carter, via e-mail

NICK'S REPLY: We're glad you like it! But what do the rest of you think? Is Group Efforts a masterpiece or a waste of space? Write in and let us know!

Microsoft lover

I'll be surprised if you publish this: What's going on? Have you got shares in Linux? It seems to me that at every opportunity **PC Plus** is pushing Linux down our throats. I know that a large number of readers are quite enthusiastic about it, but even they must be getting fed-up with the constant promotional nature of your editorials.

Why don't you go the whole hog and re-name the magazine "PC Linux"? Some of us actually like Microsoft products, which is another reason I'm writing to you, it would make a change to read an article praising Microsoft, a company whose only crime is being successful and making a lot of money (something we would all like to do).
Ken Heatley, via e-mail

NICK'S REPLY: Well, I think the US Justice Department would disagree with you about Microsoft's crimes! We get an almost equal number of e-mails from both Linux and Microsoft supporters, reprimanding us for concentrating too much on the other. Common sense seems to indicate that we've got the balance just right ...

Hydra-headed Microsoft

Perhaps I'm missing something, but which of the baby Bills is Banksie talking about? Operating systems or applications? Microsoft has dominated the PC industry for three main reasons (in no particular order):

1. Anticompetitive practices
2. Having 'good enough' software
3. A desire on the part of users to have 'compatibility'

Realistically, the compatibility issue is no longer a problem because of the requirements of the Internet. In areas where the software wasn't good enough early enough, Microsoft never made a great impact, for example, Desktop Publishing, where Apple got a foot in the door because of early adoption on a GUI. Remember also that Apache runs about 60 per cent of Web servers, compared to about 20 per cent for the Microsoft.

Similarly, in the hand-held arena, Psion has held Windows CE at bay and Palm has made headway against Windows CE.

The current generation of WAP devices is not going to define any winners either. Arguments over four line and eight line screens are fairly small beer when compared to current PC browser standards that users are used to.

I've no doubt that Microsoft, whichever bit is discussed, will be the major players in any market it enters, but as was seen with Standard Oil and AT&T, the US government does have some effect.
Jerome Davies, Inverness

NICK'S REPLY Nitpicking a little, this figure that 60 per cent of Web servers run Apache has been much bandied around, but rightly or wrongly, you find these tend to involve much smaller, less critical services. Microsoft points out that none of the top ten biggest e-commerce sites run Apache.

Unlike previous anti-trust cases, it's a much more open question as to how much consumers will benefit from the break-up of Microsoft. That we'll have to wait and see.

Consumer backlash

I find it very disturbing that all segments of the computer media espouse targeted advertising as an advantage of the latest WAP technology. It would be extremely annoying if my WAP phone went off every time I walked past a high street store, informing me of what I need to buy from that particular shop. Should we not be concentrating now, before it is too late, on strategies and legislation to curb the more intrusive aspects of digital advertising?
Kevin Awon, via e-mail

NICK'S REPLY Absolutely. The key is to keep the power of choice in the hands of the users, so that – at the most basic level – we can simply switch off those annoying advertisments.

PRIZE WINNING STAR LETTER

ADSL and fast PCs

Dave Pearman's column made interesting reading. I heartily agree that there are better ways of spending our hard-earned cash than on faster processors, but is ASDL one of them? I'm not convinced. Way back in 1983, I started using a 1,200 baud modem to access bulletin boards. This was pretty much state-of-the-art at the time, and was totally brilliant: there was a wealth of accurate and up-to-date information available from suppliers at my fingertips, and I loved being able to read technical bulletins and download updates and patches in real time.

Except... gradually, the service I received started to deteriorate. As more and more people got turned on to digital communications, connections became more problematic. Even if I did manage to find a free line, chances were that the connection would fail half way through a download. I found that the only way to get any kind of decent performance was to either start very early or very late in the day (7 o'clock either way).

Upgrading to a 2,400 baud modem brought some initial respite. This, however, only lasted until everyone else started upgrading as well. And so on, until now.

Will ASDL work? I certainly hope so. However, speed is not just about the link between you and your ISP – it's about everything between you and the source or destination you're trying to communicate with. If your ISP doesn't have the bandwidth to cope, then ASDL offers no real advantage over any other type of connection.
Stewart Argo, via e-mail

NICK'S REPLY Very true. Indeed many commentators have noted that this is a potentially significant problem with ADSL. But given that we're unlikely to get perfection, at least it offers some improvement, at least until we all get cable modems – and those suffer from the same problems, too. Will we ever see ideal speeds on the Net? Probably not.

5 years ago

Reading the '5 years ago' article on the closing pages of the July issue, my mind was cast back through the years that I have worked in the PC industry.

Things haven't changed that much: machines today may be faster, more dynamic, easier to use, but they still come in boring cream boxes with a couple of slots on the front and inside nothing more than a simple jigsaw of pieces that slot together. In fact, the only significant change I have seen is price.

Seven years ago a 2MB SIMM would set you back £70, today memory is less than a pound a meg.

It is only a matter of time before PC components will be sold in supermarkets and sold much the same way as groceries. Even today, buying a PC is as simple as buying a TV, stereo or washing machine.

Is this what users want: the PC to become a white product appliance, like a fridge or dishwasher? If so, PCs will become just as easy-to-use as a dishwasher.

The end result would be Bill Gates' vision, a computer in every home. But will this mean the end of on era for geeks, techies and the nerds. We will have to wait and see – or maybe you could start a new column '5 years from now'.

Darren Porter, via e-mail

NICK'S REPLY Wider PC ownership is most definitely a good thing, but there'll always be a place for the techie and the enthusiast, who did, after all, invent the personal computer and build the industry. There's an interesting article at www.edge.org 3rd_culture/gelernter/gelernter_p.html on a radical vision for computing in the future.

C++ Builder 4

In your July edition (Issue 165) you enthusiastically praised Borland for giving you the go ahead to include C++ Builder 4.0 Pro on DVD. Though I commend Borland for doing so, I am left wandering if it specifically restricted you to DVD publication only. As I have moved to the DVDs world yet, I ask whether you rate us CD-ROM users as second-class citizens.

Alek Jankowski, via e-mail

NICK'S REPLY No conspiracy. We hope you'll have noticed it was on last month's SuperDisc – we prefer to stagger these things over two months to get the widest possible coverage.

Censorship on the Net

I just read your article in **PC Plus** July 2000 to do with censorship. The point you make about cowardice – anonymity is the last refuge of the scoundrel – iss just so true.

There was precedent for the action against Demon in amateur radio packet networking. Sadly, the Radio Authority clamped down on what responsibility a BBS or other node owner had. It threatened to remove its ham radio licences if so called 'illegal or pirate' traffic was carried over its links. This has made me give up a worthwhile hobby. No 'big deal' for me because the BBS telephone network replaced that which I had on ham radio bands. Let's hope that any censorship applied to the Internet does not follow these restrictions.

John Kirk, via e-mail

Talking point

VOTE NOW!

Should BT be able to claim patent on the hyperlink?

- ☑ Yes, they earned it
- ☒ No, software patents are bad
- ☑ Yes, if I get to sue BT for broken links
- ☒ No, it goes against the free ethos of the Web
- ☐ Don't care so long as I don't have to pay

Visit www.pcplus.co.uk and cast your votes now – results printed in next month's issue.

Write to PCPlus

Let us know what you think of the magazine

What do you like (or dislike) about the magazine? What would you like to see? And what do you think about the products and companies in the PC industry? Whatever the answer, we want to know.

➜ Please write in. Short, concise letters or e-mails are much more likely to be used, as life's too short to extract the important bits from a massive submission. We give a Star Letter prize away in every issues, so get those letters coming in.

➜ E-mail is the best way to send your comments. For Mailbox send them to: pcplus.editor@futurenet.co.uk or fax them to: 01225 732295.

➜ Alternatively, print your letter and send to: Mailbox, PC Plus, Future Publishing, 30 Monmouth Street, Bath BA1 2BW.

➜ Every letter will be read by the editor, and the most interesting (not the most complimentary!) letters will be printed and answered on these pages. We reserve the right to edit letters to fit, and the opinions expressed on these pages are those of PC Plus readers, and do not necessarily represent those of the editorial team. Letters and e-mails are assumed to be for publication unless stated otherwise, and published versions of letters become copyright Future Publishing.

➜ We regret that we can't always answer letters personally, but questions of general interest may also be covered in Help Screen.

Next steps in graphics: PART ONE

The secrets of transparency

NEW SERIES

The new version of Abobe Illustrator lets you work with live transparent objects in original ways. **Alistair Dabbs** explains how it can aid your work

Transparency may have been a long time coming to Illustrator, but we have to admit that Adobe has made a good job of it. The reason it took so long lies in the concept of vector illustration itself. These packages were originally designed for drawing diagrams, flowcharts, text, logos and so on. No one anticipated that artists would start using it to generate photo-realistic pictures. And while other software developers began to escape the vector chain gang and produce transparent effects, Adobe had somehow cuffed itself to the railings because its own graphics language, PostScript, didn't support transparency at all.

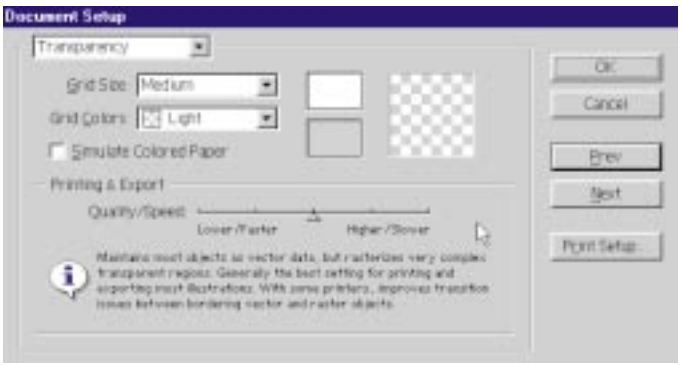
So why didn't Adobe rewrite PostScript? Well, there's a limit to what you can do with a page description standard that the entire print industry (many times bigger than the computing industry, remember) has standardised upon. To support full native vector transparency, PostScript would have to be rebuilt from the ground up, probably wholly incompatible with everything that preceded it. And all this just to please some designers who would rather not use a bitmap package like Photoshop.

Adobe's answer

Although PostScript 3 doesn't support actual transparency, it can be made to impersonate it in certain circumstances. In the past, Illustrator did this by letting you apply Pathfinder tools which produced the illusion of transparency by breaking overlapping vector objects into pieces, where the overlapping sections became new objects with their own intermediate colour fill. Illustrator 9 produces the same kind of illusion but does it in the background, and only when you print your artwork or export it to other file formats. At the front of this is a much more user-friendly interface which lets you think you are applying real transparency. But more important still is the fact that you are no longer forced to combine, re-edit or otherwise disrupt your artwork: the actual transparency calculations are done on the fly when outputting, so preserving the on-screen shapes precisely as you created them.

This works fine for flat transparency areas. It's not going to work when your object transparency is a gradient or even a pixel-based bitmap mask. Adobe therefore came up with a neat idea: let PostScript break up overlapping transparent vector objects whenever it can, and any areas of a document that are too complicated to handle this way get rasterised as hi-res bitmaps. This is done, yet again, on-the-fly, so it isn't necessary for you to decide what remains vector-based and what will be rasterised.

However, if you give PostScript enough processing power and memory, it's possible, theoretically, to let it generate billions of vector objects, each the size and shape of one pixel. This means that you could actually get PostScript to manage transparency entirely with vector information. In practice, you'd never have enough memory and your printer, if it didn't spew out a PostScript error, would take a week before printing anything at all. At the other extreme, if every overlapping transparent area in a document was automatically rasterised to a bitmap when output, you would probably print a great deal faster than letting half be rasterised and the other half treated as vector objects.



↑ **The slider in the bottom half of this dialog box tells Illustrator how you wish transparent objects to be handled by its on-the-fly raster and vector processing methods.**

Dealing the cards

So Adobe came up with an even better idea: you get to tell Illustrator roughly how you would prefer it to deal with your artwork when printing or exporting to another file format. In the Document Setup dialog box type [Ctrl]-[Alt]-[P] to call it up, select Transparency from the pop-up menu and choose your output preference from a simple slider.

Towards the left, the slider tells Illustrator to rasterise more transparent-effect objects in your artwork to bitmaps, leaving only the simplest overlapping areas as vectors. Depending upon your determined output resolution, this will normally print faster and is a good option when proofing your artwork locally.

Note, however, that printing at high resolution in this output mode will generate huge files and can actually end up being slower, but may still be the best option if your artwork contains large quantities of very complex transparency effects.

Towards the right, the slider tells Illustrator to maintain more of the transparent objects as vector data. Often this improves the appearance of fine hairlines and the crispness of tiny detail, but can take longer to process and will require heaps of memory regardless of the apparent size of the document file itself.

You make your choice on a file-by-file basis rather than as an application default and can change the setting whenever you like according to the output device you are printing from or the file format you are exporting to. So now you understand where Adobe's solution to the vector transparency problem is coming from, get using it. You won't find a better PostScript-clean approach anywhere. PCP

Alistair Dabbs
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FORUM **www.pcplus.co.uk/forums/windows**

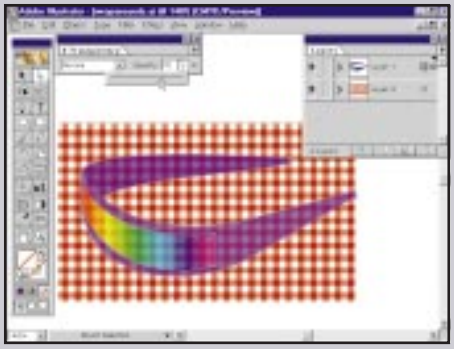
PCPlus NEXT MONTH

How to produce your own stunning ad banners

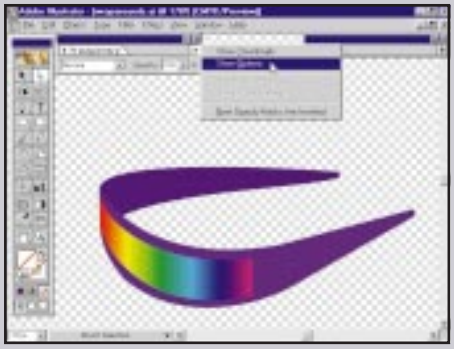
Creating transparent knock-outs

With clever use of Illustrator's new transparency features, you can alter the opacity of objects individually or in groups, and even create knock-out masks without having to edit the artwork itself

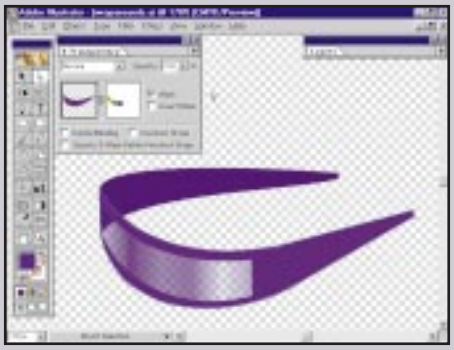
1 Let's make things as simple as possible. We've drawn a pair of cheesy wraparound sunglasses using just three vector objects created with the Bezier Pen tool. You can see how the objects appear singly underneath the completed version: a dark purple rear band, a slightly lighter purple font band and a visor object which has been given a rainbow gradient fill from the standard Swatch palette. All we've done is overlap the three objects to create an illusion of a whole: they have not been joined, grouped or combined in any way – yet. For the sake of this walkthrough, none of the objects have stroke outlines.



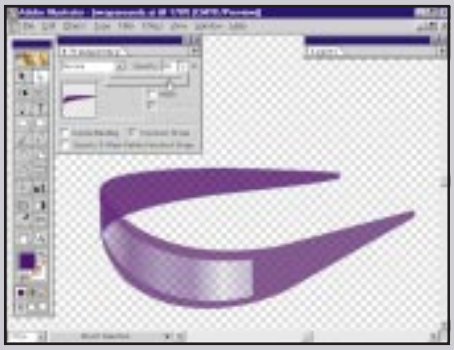
2 Open the Layers palette and add a new layer. Draw a large rectangle in this new layer and fill it with any pattern from the Swatch palette. Then send the layer behind the original one by dragging its name downwards in the Layers palette. If you now click once on the circle next to the layer name containing your wraparound sunglasses, everything in that layer is selected as a group. Open the Transparency palette, click on the Opacity pop-up and drag its slider to the left. The effect is to reduce the opacity of the entire selected layer, allowing the background to show through.



3 The problem with that approach is you can't apply individual opacity values to individual objects – say if you wanted the wraparound's visor to appear more transparent than the translucent plastic frames. For clarity, return the opacity level of your glasses layer back to 100 per cent and hide the new layer you created containing the patterned rectangle. Then from the View menu, select Show Transparency Grid (or press Ctrl-Shift-D) to call up a Photoshop-like background checkerboard which helps you preview and test transparent effects. From the Transparency palette pop-up menu, select Show Options. This will expand the palette with its full control set.



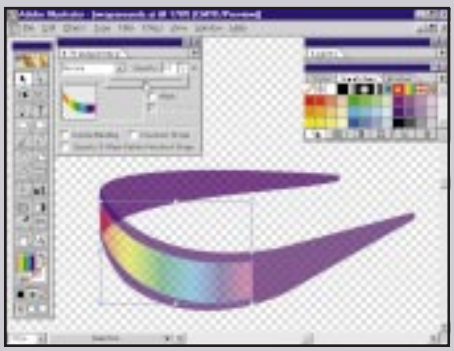
4 Click on the Direct Selection tool (the white arrow in the main toolbox) and click on the visor object. Hold down the Shift key and click on the front wraparound band so that both objects are selected. Leave the third object at the back alone. You will see a thumbnail of the two selected objects in the Transparency palette. Click on the Mask check item next to it. Suddenly, the front-most object (the visor) becomes a transparency mask linked to the secondary object (the purple band). Note how the greyscale values of the gradient are applied and their actual colour fill values lost.



5 Note also that where transparency is low in the visor mask, you see more of the purple of the band object behind it; where it is high, you see through to the background. The visor itself appears to have ceased to exist as an object. Indeed it can only be selected for editing if you click on its thumbnail in the Transparency palette. Otherwise, note that you can now alter the opacity of the purple bands individually by selecting either and dragging the Opacity slider. However, as you reduce the opacity of the masked band at the front, the opacity of the visor object will be reduced accordingly.

6 To better understand what's going on, click on the masked purple band to select it and then click on the visor mask thumbnail in the Transparency palette. Open the Swatches palette and click on the colour Black. This replaces the visor's gradient fill with a solid black. The effect is to create a 100 per cent transparent mask which itself has the effect of a see-through knock-out as shown. You can produce the same result using Pathfinder tools, but this way you haven't destroyed or altered any of your artwork, just applied a transparency mask which can easily be revoked simply by removing the Mask check in the Transparency palette.

7 Now let's put that original rainbow visor back. There are actually several ways you can do this. You could draw a new object, fill it with a gradient and send it behind the existing artwork, or indeed you could recombine it as part of the mask group in order to knock out any ragged edges. But we'll choose the simplest method. With the visor mask still selected, choose Copy from the Edit menu (or type Ctrl-C). Click back on the main purple band thumbnail in the Transparency palette to select the whole masked object, and select Paste In Front from the Edit menu (or type Ctrl-F).



8 You will see a black visor object appear precisely over the original, except that it is placed at the back of the overlapping objects. Type Ctrl-Shift-] to bring it to the front of your artwork and click on the rainbow gradient in the Swatches palette to re-apply its original fill. You are partly back where you started, except that you can now make the new visor alone transparent using the Opacity slider. The knock-out transparency mask you created allows you to see right through the visor rather than just to the purple object immediately behind it. Yet you've not had to alter the individual shapes themselves.

9 You can use this knock-out transparency effect for reshaping your artwork in other ways. Here we've decided to add a little notch in the wraparound sunglasses for a nose. We could have sliced through the existing object shapes and added the notch indent using the Pen tool. Instead, we've just drawn a quick triangle with the Pen tool, filled it with black, and then selected it and the wraparounds behind it. All we have to do now is click on the Mask check in the Transparency palette to make the triangle vanish and knock out its shape from the wraparounds. Just click on the triangle mask thumbnail to edit and move it around.

Expert techniques: PART ONE

Pointers and Java Script

Pointers are one of the most powerful features of C, and they're in JavaScript too. **Paul Stephens** shows how they can help to make pages flexible and cross-browser compatible

Programming purists are fond of saying that JavaScript isn't based on C++, which seems a bit odd given that its syntax is a subset of C++'s, with support for C-specific constructions such as 'if (++a == b)'. A key feature of the original C language was pointers, which brought the flexibility of assembler programming to a high-level coding system. Sure enough, pointers are alive and well in JavaScript, and capable of doing great things in both Netscape and Microsoft Web browsers.

In JavaScript, pointers are variables which contain the addresses of objects and functions. They let you manipulate objects and call functions without knowing exactly which ones you're dealing with, by specifying pointer names instead of 'real' identifiers. This might sound a little pointless (and not to mention dangerous), but in fact it's very useful indeed, with pointers to functions especially handy when you're designing pages which need to behave differently depending on which browser they're running in. PCP

PCPlus SUPER DISC **PATH: prog\files\web**

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PCPlus
NEXT MONTH
Paul looks at calling data from a browser using cookies

Creating a pointer

Why would you want to use pointers? There are a number of reasons, illustrated below

Creating a function pointer in JavaScript is easy. Here's an example:

```
<img name="image1"src="pic1.jpg">
<script>
changePic = switchPic
changePic(document.image["image1"], "pic2.jpg")
function switchPic(picObj,newSrc) {
  picObj.src = newSrc}
</script>
```

This first script statement creates a pointer variable changePic (if it doesn't already exist), and points it at the function switchPic. Two important syntax rules apply – don't use a var keyword ("var changePic = "), and don't put any brackets after the function name ("= switchPic()"). The function itself doesn't have to precede the pointer declaration – JavaScript will find it.

The second script statement calls changePic() exactly as if it was a function. It's really a pointer though, so JavaScript finds the function it's currently pointing at (switchPic()) and executes that instead. Neither the calling statement nor the executed function 'know' that the call has been indirected via a pointer.

That's the clever stuff but why would you want to do it? The switchPic() function changes the source file of a specified ‹img› object, and is compatible with Netscape and Microsoft browsers. However here's a different image tag:

```
<img name="image1"src="pic1.jpg"
style="filter:revealTran(Duration=0.7,Transition=12)">
```

The 'filter' style sheet attribute applies only to Internet Explorer 4.0 and later, and is ignored by Netscape and other browsers.

It gives the tag a visual filter which performs an image-dissolve when you change the tag's source file – but only if you execute the right filter-activating JavaScript statements when doing it. Here's a function to do just that:

```
functiondissolvePix(picObj,imgfile){
picObj.filters.revealTras.Apply();
  picObj.src = imgfile
picObj.filters.revealTras.Play() }
```

Calling this function is fine in IE, but Netscape will take great exception when asked to execute JavaScript statements such as picObj.filters.revealTrans.Apply();.

If want your page to work in both browsers, you'll have to take defensive action. One way to do this would be to pepper the page with browser checks, perhaps by saying:

```
if (RunningIE4)
{dissolvePix(document.images["image1"],"pic2.jpg")
  } else {
switchPic(document.images"image1"], "pic2.jpg") }
```

The boolean variable 'RunningIE4' is set by a browser-checking function msieversion(),which you'll find in the sample pages on this month's **SuperDisc.**

Using pointers

You could write a single, cross-browser image changer function, with the filter-handling statements guarded by browser-checking if()s.

Both approaches are messy and error-prone though – and what happens if a third browser version hits the market, with an even better image-switching feature whose activating code would crash other programs? Pointers provide a much neater solution.

```
if (RunningIE4) {
  changePic = dissolvePix
  } else {
  changePic = switchPic}
```

Above is some JavaScript code from the ‹head› section of a page: Executed when the page loads, it points changePic at one of two browser-specific image-changer functions. Elsewhere in the page, you can now say…

```
changePic(document.images"image1"], "pic2.jpg")
```

…without worrying about which browser the page is running in. The two image-changer functions ignore browser compatibility issues too, with changePic() a plain-vanilla routine for any JavaScript-enabled browser, and dissolvePix() a dedicated IE4-only function.

By organising things this way, you'll greatly reduce the risk of compatibility

problems later on. What's more, when that wonderful third browser comes along, you can just write a function for it, then add it to the list of possible pointer targets.

Inflight changes

By updating a pointer (making it point at a different location) you can change a page's behaviour while it's running. I used these techniques in my Prisoner's Dilemma game at **www.paulspages.co.uk/dm1/dm1.htm**. It comes with four strategy function for playing against its human opponent.

At the start of each game the page chooses a strategy at random, setting a pointer variable 'rplay' to point at the appropriate function. During the game, the gameplay code simply calls 'rplay(param1, param2)', without knowing which strategy will actually be executed. At the start of the following game the page chooses a different strategy and updates the pointer, without reloading the page. I could have handled my start-of-game selection like this:

```
// genRandNum() is a user defined function – see dm1.htm
source
stratNum = genRandNum(0, 3)
switch (stratNum ) {
  case 0 :
  rplay = playtit4tat
  break
case 1 :
  rplay = playrandomDefects
  break
etc...
}
```

However that's pretty long-winded, and error-prone. For this kind of 'pick one from many' selection process it's often better to use an array of pointers

```
stratfunctionpointers = new Array(playtit4tat,
playrandomDefects,playreactiveDefects,playsust4t)
```

where 'playtit4tat' and so on are the names of functions declared elsewhere in the page. Each element of the array is a fully-functional pointer, so having placed a random number in stratNum, I could say something like stratfunctionpointers [stratNum] (param1, param2) in the gameplay code. However, it's neater to say

```
rplay = stratfunctionpointers[strtNum]
```

in my start-of-game code, then make simple rplay() calls during the game. Thus rplay doesn't get pointed directly at a function, but instead is set equal to the value of another pointer – it still works though.

The pointer-array technique also lets my random selection process adjust automatically to extra entries in the function list. By making my random selection statement:

```
stratNum = genRandNum(0,(stratfunctionpointers.length -1))
```

It'll always end up with a number between zero and the last element in the array. The Dilemma application involves choosing functions at random, but you can easily offer your users a choice via form controls.

➔Keep it consistent!

Cross-browser compatibility is hard to achieve so don't make it more difficult for yourself

➔When you're writing a set of alternative functions like the two image-changers in our examples, it's essential to keep the interface (the parameters supplied with the function call, and the result, if any, received back) the same for all of them. If the call has to be 'changePic(object, file)' when it's Netscape, and 'changePic(file, object)' when it's IE, then the 'transparency' effect is lost.

That said, it's okay for functions not to declare trailing parameters which they don't use. For example, the dissolvePix() function might take a third parameter, dissolveTime, like this:

```
function dissolvePix
(picObj, newSrc,
dissolveTime)
```

and the page's image-change calls might take the form:

```
changePic(document.images
"image1"], "pic2.jpg",
0.7)
```

Despite this, the non-IE function could still be declared as:

```
function switchPic(picObj,
newSrc)
```

with no mention of a third parameter. A better approach, however, would be to declare the extra parameter in both functions, and just ignore it in the non-IE one. Then if you wanted to add a parameter to the non-IE function you'd make it the fourth entry, and add it to the IE-specific function too (even though it might not use it). That way the two functions remain in step.

Radio buttons and single-selection drop-down list (‹select›) controls are ideal, as they both generate one-from-many choices. See the form-controls page on this month's **SuperDisc** for working examples.

Method acting

Function pointers have another valuable use – they let you add custom methods to objects. Going back to our image-switching examples, here's a different form of pointer assignment:

```
document.images["image"].changePic =dissolvePix
```

This statement gives document.images["image1"] a new method, changePic(), which you can call like so: document.images["image1"]. changePic("pic2.jpg") changePic is a pointer, and the code that gets executed is in the function dissolvePix(). If you point changePic at a different function. (document.images["image1"]. changePic = switchPic), then you'll get a different result.

That's clever too, but why do it this way? One answer lies in the contents of the method-acting version of dissolvePix(). Here it is:

```
functiondissolvePix(imgfile){
this.filters.revalTrans.Apply();
  this.src =imgfile
this.filters.revalTrans.Play()
}
```

Instead of taking the image object name as a parameter (see earlier example), it uses the reserved object identifier 'this', which refers to the object for which it's currently acting as a method (document.images["image1"]). The code is simpler, and you can't get the object reference wrong. The result – one less opportunity for error, and fewer debugging sessions.

Object lessons

In Internet Explorer, those document.images["image1"] references aren't necessary since IE lets you reference objects directly by their tag's name=attribute. For example, having declared this tag:

```
<img name="myImg"src="pic1.jpg">
```

you can say

```
myImg.src = "pic2.jpg"
```

Luckily you can get the same effect in Netscape by using pointers to objects. Creating an object pointer is the same as creating a function pointer:

```
myImg = document.images["image1"]
```

myImg can now be used in Netscape (and IE) like this:

```
myImg.changePic = switchPic
myImg.changePic("pic2.jpg)
```

As well as producing more compact and readable code, this technique can help to make IE-only pages Netscape-compatible, too. However there are some important points to remember.

First, your tags must be named via name= attributes, not the id= attributes more usually employed in IE – image tags without name= attributes aren't included in the document.images[] collection by Netscape, so you won't be able to assign pointers to them. Second, don't try to assign the pointers via inline script code in the ‹head› section of the page – this code is executed before the ‹body› section's tag objects have been created, so the browser will throw up 'object doesn't exist' errors. Instead, put the code in an inline script at the end of the ‹body› section, or in a function called by the ‹body› tag's onload= event.

Finally, if you're aiming for IE/Netscape compatibility, beware of statements like this:

```
myImg = document.images["myImg"]
```

Netscape happily processes this, but IE gets confused, because the pointer name and document.images[] index are the same (myImg), and it's already created a myImg pointer. It's still a good idea to use the same names in Netscape though, so the answer is to protect the statements via a browser check, for example if (! RunningIE4). Here's a routine which automatically generates same-name pointers for all the objects in the document.imagfes[] collection:

```
if (!RunningIE4) {for (i in document.images){
  xname = document.images[i].name
  eval(xname + ' = document.images["'+xname+"]')
} }
```

The trick lies in the eval() method, which interprets a string expression as if it was a line of JavaScript code – something even C++ itself would have difficulty doing.

Until next issue, happy authoring!

Getting started with Linux

How to compile source code

It's one of the first things you need to learn when you adopt Linux. **Maurice Kelly** reveals the dark art of compiling...

PCPlus SUPER DISC **PATH: \prog\linux**

One of the key advantages of the GNU/Linux operating system is the fact that it is free. Fortunately, many of the programs available for Linux are also free software which not only cost you nothing, but also come in source code form, which you can do with as you please.

Freely available source code means that you don't have to rely on pre-compiled binary programs. This has particular advantages in the cross-platform nature of Linux, where binaries for one platform will not run on another.

Even within x86 Linux, there are times when binaries are not appropriate – a binary compiled for a Pentium-class processor will not suit a 386 or 486 processor.

Also, most binaries are distributed as some sort of package, usually geared towards a particular distribution or family of distributions. Sometimes these packages do not install well on alternative distributions, so compiling from source can be extremely useful.

Getting the source

Most source files come archived as tarballs – these are collections of files tarred into one large file (man 1 tar for more information), and gzipped for compression (man 1 gzip for more information). A tarball will generally end with either .tar.gz or .tgz. Many newer source distributions are now compressed using the more efficient bzip2 compression method – you can easily identify these files as they will end with '.tar.bz2.

We're going to be compiling the Pan newsreader for GNOME which comes in both gzip and bzip2 archives. Getting the source code out of the archives is a simple affair.

www.superpimp.org

First, though, we'll keep things tidy in our home directory and create a sub-directory called source. For the gzipped tarball (such as pan-0.8.0.tar.gz, now located in our new 'source' directory) it is a simple case of issuing the following at the command prompt:

```
tar xzvf pan-0.8.0.tar.gz
```

All being well, this will create a new sub-directory and extract the contents into it. This is the source tree and we need to enter this new directory in order to progress.

If you are using a bzip2 archive, things are not quite so simple. The z option to the tar command specifies that it should be decompressed using gunzip (the decompression part of gzip.)

Some versions of tar accept the y option which specifies bunzip2 rather than gunzip. Not all versions do, so you may need to use the use-compress program option. This time invoke tar with:

```
tar xvf pan-0.8.0.tar.bz2 –
use-compress-program bzip2
```

↓Here we see the base of the Pan source tree. You should find the files README and INSTALL which will guide you through installation.

As with the gzip archive, this should create a new sub-directory containing the source tree.

Using the source

Extracting the source is just the first step – now we need to build it. There is a fairly standard method by which programs can be built, but it is not guaranteed to work with every source distribution and is no good if you want to vary from any of the default parameters.

To make sure you follow the correct procedure, you should always read the instructions before attempting to compile anything. We recommend looking for the files README and INSTALL (don't worry if you don't see those exact files – just look for something similar.)

The README file gives you some general information about the program and will, most likely, point to the INSTALL file for detailed installation instructions.

↑It's not always as straightforward as we would like – 'configure' will let you know when you are using the wrong libraries.

The quick way to compile a program is to follow the steps below while in the main directory of the source tree (in our case ~/source/pan-0.8.0):

```
./configure
make
su -c "make install"
```

Configuring the build

First, ./configure runs a script in the top directory of the source tree. This is a script put together by the developers and, when run, will usually spew a large amount of information to your terminal window – it might look like a load of garbage but it is the result of a series of checks. The checks ensure that dependencies for the software to build are satisfied.

Configure usually checks for required source files that are not part of the program's source distribution (for example, with Pan we need the development source files for GNOME libraries and the X Window System, as well as the standard glibc libraries.) It also

checks for programs needed to build the application, such as the compiler, make and other development tools.

At the end of all the checking (and assuming the critical checks passed) it creates a series of Makefiles, scattered among the directories of the source tree.

Configure is a complex script and can accept a number of parameters – for a list of these run ./configure – –help. These give you a lot more control over how your program is built. You can specify installation locations for man pages, libraries and executables, as well as the location of include files and existing libraries on the system in case you have multiple versions to compile against. Check the INSTALL and README files for the developers' recommendations on how to run configure for more than the default settings.

Making the executables

Building applications from source requires running the source files through a compiler. A simple program could be compiled by passing the filename to the compiler, but for complicated software it is impractical to do this because many source files must be compiled and linked together. The Pan sources contain more than one hundred files and many of these are source code required for building the application. All these files cannot be built by hand so some form of automation is required.

The compiler comes in the form of the 'make' program – this program processes a list of instructions to build the binary files required. The list of instructions comes in the form of a Makefile – our Makefile was generated for us by ./configure in the section above. To kick off the compilation process we issue the command:

```
make
```

Invoking make with no parameters selects the default target, which, for almost all source distributions, will build the program. The make program will then trundle through the 'Makefile' building everything required for the application. You should see a large amount of text going through your terminal window – this is the program being built. When this finishes the program is ready. Now it just has to be installed!

Installing the executables

Once the program has been built, the next step is to install it. Make is here to help us out. Most source distributions create a target for make called install – running this target should install the binary files, documentation and configuration files to the appropriate places. You can't just do this as any old user, though – your normal user probably does not have write access to the locations where the files should be copied. Therefore, you must be root to install an application – the quick way to achieve this is to issue the following command:

```
su -c "make install"
```

The -c option causes 'su' to execute the specified command as root, and then return to your normal user. Upon entering the command you will be prompted for the root password. Once you've entered it, you should see a lot more scrolling text as make does its work. When it stops, your application should have been installed. To see if it worked, try running the application:

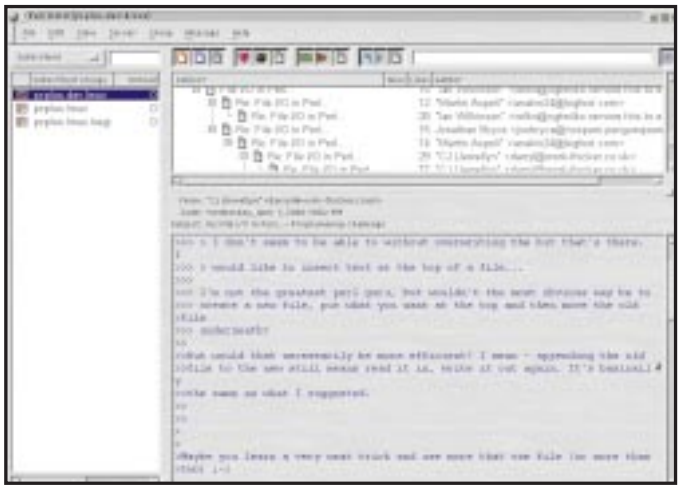
```
pan
```

If the application runs, you've successfully completed an installation from source.

Unfortunately, installing from source is not always so straightforward. The steps described above will work for many applications, but some may have special intermediary steps. Some will have variations on the above – for example, the Perl distribution requires you to fill in certain details about your system as part of its 'configure' script. That is why it is important to read the documentation so that you install things correctly.

There will also be times when things don't go as planned. For example, running the 'configure' script with Pan caused problems for us, as our glib and GTK+ versions (GNOME libraries) were less than 1.2.7. We went off to GNOME Web site and picked up some updated copies, then built and installed them. If you are compiling software for the first time you may even find that you don't have a compiler (or other development tool) installed – 'configure' will catch the absentees and alert you as to what is missing.

www.gnome.org/



↑ **The end result: One nice little newsreader for GNOME looking at pcplus.dev.linux.**

We were fortunate not to have any compilation problems, but if you are trying to install development software, there are no guarantees that it will always build. Some code will display error messages during the make stage – unless the build stops, you can usually ignore these.

Compiling from source can be very useful for software that isn't packaged, or whose packages do not suit your system. It is also useful if you are a programmer and wish to tweak applications to suit yourself. You should be careful, though, because it can sometimes be a bad thing to add source distributions to a package-managed system, especially if you are adding libraries. PCP

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How to use make

The make command can be used for more than just building and installing applications

If you've compiled a kernel before, you should know that you can use the command Make Clean to clean out the source directories and perform a fresh compile. This can be used with many other source distributions (such as Pan in the tutorial) and can be useful if you want to free up some hard disk space without deleting the entire source tree.

Some configure scripts may also create a Makefile with a target called uninstall. As the name suggests, this removes the application that you installed using make install.

You should take care with this – it will simply remove all the files it installed, so watch out if you have modified the programs in any way. It also requires that you keep the source tree hanging around on your hard disk, so if you are short of space you may not have the option of keeping all that source hanging around.

What file location?

You can put them here, there or everywhere...

An important, and sometimes crucial, aspect to consider is the location you wish to install your applications and associated files. You can choose the base location by passing the —prefix=/path option to the configure script. For example, to install binaries to /usr/bin, libraries to /usr/lib and man pages to /usr/man, issue the command:

```
./configure –prefix=/usr
```

The other main location for programs is /usr/local. The choice of whether to install to /usr or /usr/local is dependent on a number of factors. For example, installing GNOME libraries on a system requires all the libraries to be installed into the same area (that is, all in /usr or all in /usr/local.)

My personal philosophy is to put self-compiled applications in /usr/local and put pre-compiled binaries in /usr. The Filesystem Hierarchy Standard www.pathname.com/fhs recommends that you install to /usr/local any software that should not be upgraded by a system upgrade.

PCPlus

NEXT MONTH

Share your Linux files with Windows machines using Samba

PCPlus SEE YOUR SUPER DISC

Expert Linux

Running Windows applications in Linux

How can you run Windows applications on Linux? WINE is your answer, says **Chris Jones**

Windows may not be everyone's cup of tea, but it does have a huge number of available applications that Linux can take advantage of. The WINE (WINE Is Not an Emulator) project may not be the most dynamic name ever but it's extremely exciting.

Through the use of the Windows documentation and some clever reverse engineering trickery, the WINE team is producing a free, open source implementation of the various Windows APIs (Application Programmers Interfaces). These make up MS-DOS, Windows 3.1 and Windows 9x. Still not impressed? Well, put simply, WINE lets you run Windows applications in Linux.

You can do it

That prospect should interest just about every Linux enthusiast – the possibility of running all those important Windows applications without having to reboot into Windows or tie up valuable system resources with a virtual machine such as VMWare is a tempting one.

It's not all good news, unfortunately. WINE isn't finished yet because only around 90 per cent of the Windows API has been implemented so far, and the final 10 per cent is always the hardest in any project. However, it is already at a state where some applications can be run almost – if not completely – problem free. As a general rule, simple applications work better but there are complex applications which are now able to work correctly.

PCPlus SUPER DISC **PATH: /linux**

Since WINE is still in heavy development, its stability at any point in time can be variable, but public snapshots are released roughly every two weeks and if one doesn't work well, the following snapshot may work better.

On this month's **SuperDisc** you'll find the latest snapshot in both tarball and RPM form. The tarball gives you greater control over the things that will be built into WINE. Also on the **SuperDisc** is the latest Mesa which WINE requires (if you followed the Utah-GLX workshop in Issue 163, you'll already have Mesa installed). PCP

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PCPlus
NEXT MONTH
We begin a new series with My SQL and PMP

Installing WINE

Armed with our SuperDisc, you can run Windows programs on your Linux system. Here's how:

1 The first step is to install Mesa (an implementation of OpenGL) assuming you don't already have it. Full instructions are included in the Mesa tarball or you can just install the RPMs provided.

Once Mesa is installed, you can install WINE (the following installation instructions are only relevant if you are installing it from the tarball – the RPM will do all this for you). Extract the tarball and go into the directory produced, then issue the following command:

```
./configure –disable-debug
–disable-trace
```

This will prepare the source tree for compilation. You are now ready to compile WINE. To do this, issue the command:

↑**1. Notepad is a good way of verifying that your WINE installation is working.**

```
make depend && make
```

This actually executes two commands in a row: 'make depend' does some pre-compilation processing and 'make' compiles the source code (this is a fairly complex process which may last for several minutes). Assuming there are no errors, issue the following command as root (if the compilation process does fail, check you issued the earlier commands correctly. Failing that, you will probably need to try a later WINE snapshot):

```
make install
```

2 You should now have all the libraries and programs required to run WINE installed. However, before it can be used effectively you will need to produce a configuration file for it. The install process should have placed a file in /etc/wine called wine.conf, the system-wide configuration for WINE. However, it is possible to produce separate configurations on a per-user basis by copying 'wine.conf' to a user's home directory and renaming it to '.winerc'. It isn't necessary to configure WINE for each user in this way, but it does mean different users can configure it to behave differently. Load the configuration file you are going to use into a text editor and near the top you should see a section:

```
[Drive A]
Path=/mnt/fd0
Type=floppy
Label=Floppy
Serial=87654321
Device=/dev/fd0
```

3 This is where WINE's 'drives' are configured. Since Windows sees all the partitions/drives available to it as a series of drive letters, WINE must map the Linux file system on to these drives. You can configure as many as you want and point them to different directories within your Linux file system. The most important of these drives is the 'C:' drive which should point to an existing Windows installation (it is possible to run WINE without Windows installed, but it is a fairly painful experience and will have greater difficulties with some applications). For example, if your Windows partition is mounted as '/mnt/windows' then you would need to add/edit the 'C:' entry as follows:

```
[Drive C]
Path=/mnt/windows
Type=hd
Label=MS-DOS
Filesystem=win95
```

If your Windows partition isn't mounted by default, you will need to create an entry for it in '/etc/fstab' so it can be mounted automatically each time you boot Linux. Such an entry would look like this:

```
/dev/hda1 /mnt/windows vfat
 defaults 0 0
```

this example assumes the Windows partition is the first partition on the primary master IDE drive – '/dev/hda1' and that it is a FAT32 partition ('vfat' is the name Linux uses to refer to FAT32).

If your Windows partition is on a different drive or isn't the first partition on the drive you will need to alter the '/dev/hda1' part of the entry accordingly ('fdisk' can be used to view the partition table of a specific hard disk if you are unsure of the partition's location).

If you are using an older version of Windows, or don't use FAT32 for some other reason, you should replace the 'vfat' section of the entry with 'msdos' to ensure the partition is mounted correctly. If you are using an older filesystem than FAT32 you will also need to edit the 'Filesystem=win95' line of the WINE configuration and change the 'win95' section to 'msdos'.

The man page 'wine.conf' contains more information on configuring drives if you want to give WINE access to devices such as CD-ROMs, network partitions and so on. The only other option worth changing in the WINE configuration is:

```
[Tweak.Layout]
;; WineLook=xxx (supported styles are 'Win31'(default),
'Win95', 'Win98')
WineLook=Win95
```

This controls how applications will look when they are run with WINE and, for consistency, should be set to whichever version of Windows you have installed.

4 Now that WINE is properly configured, we can begin to test it to make sure the installation has worked correctly. A simple way of doing this is to run a simple application such as Notepad or the Windows Calculator. To execute the calculator issue the following command:

```
wine -managed /mnt/windows/windows/calc.exe
```

you should see something like screenshot 3 below-right. The option '-managed' instructs WINE to use your window manager to display the applications rather than using its own window handling routines (which, although more 'Windows-like', tend to be confusing and inconsistent with the rest of your desktop). An alternative is to use WINE's 'desktop' option which creates a virtual desktop within which all of the application's windows will appear. Adding the option '–desktop 800 x 600' to the WINE command line will enable this feature.

5 Windows applications can be started with WINE in a number of ways, the first of which we have already seen – passing the path of the executable to WINE based on its location in the Linux file system. In addition to this you can also pass the path of the executable as Windows would expect to see it (for example, 'c:\windows\notepad.exe'). However, the character '\' is used by bash for indicating special characters, so you either have to call the application 'c:\\windows\\notepad.exe' (note the '\' characters have been replaced with '\\') or 'c:/windows/notepad.exe'. In any of these cases WINE will interpret the path and find the correct executable.

6 There is a much cleaner way of executing Windows executables that requires support from the kernel. As well as supporting 'ELF' executables (that is, normal Linux executables), the kernel can be configured to associate other executable types with specific interpreters. To do this you need to compile 'MISC Binary' support into your kernel – you can check if it is already present by seeing if 'binfmt_misc' appears as a directory in '/proc/sys/fs'. Configuration of this feature is done by way of the /proc kernel interface which, although convenient, does have the drawback that the data is not persistent so you will need to perform some of these steps every time you reboot (fortunately, the appropriate calls can be placed in a system startup script to save you from having to do it manually). As root, issue the following command:

```
echo ':DOSWin:M::MZ::/usr/bin/winewrapper:'
>/proc/sys/fs/binfmt_misc/register
```

(if you want this feature to be available on each boot you will also need to run that command from a startup script such as '/etc/rc.d/rc.local'). You can check this worked with the command:

```
cat /proc/sys/fs/binfmt_misc/DOSWin
```

which should produce the following output:

```
enabled
interpreter /usr/bin/winewrapper
offset 0
magic 4d5a
```

You will then need to create a script in '/usr/bin' called 'winewrapper' with executable permissions and the following contents:

```
#!/bin/sh
/usr/bin/wine -managed "$@"
```

7 The reason for this wrapper script is that the kernel cannot pass options to the interpreter (in this case WINE) so you can put your favourite WINE options in the wrapper script. Now when you want to start a Windows application you can execute it in the same way you would any normal Linux application, so starting the calculator would simply be a matter of issuing the command:

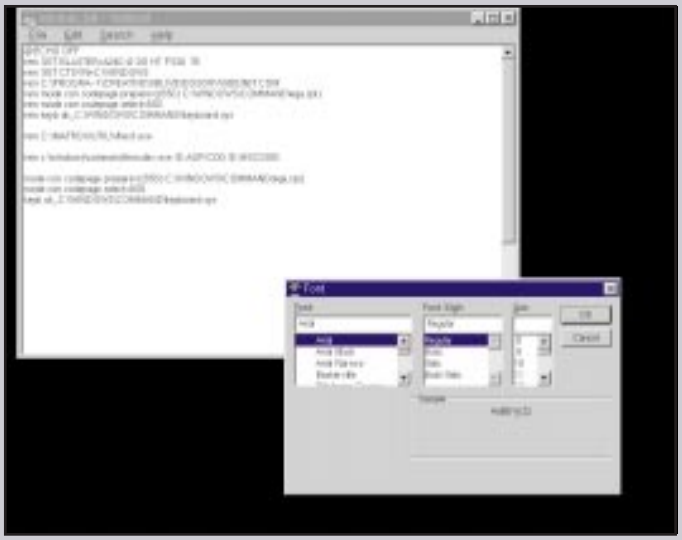
```
/mnt/windows/windows/calc.exe
```

At this point you could add Windows directories to the '$PATH' shell variable and avoid having to type the full path. To do this, issue the command:

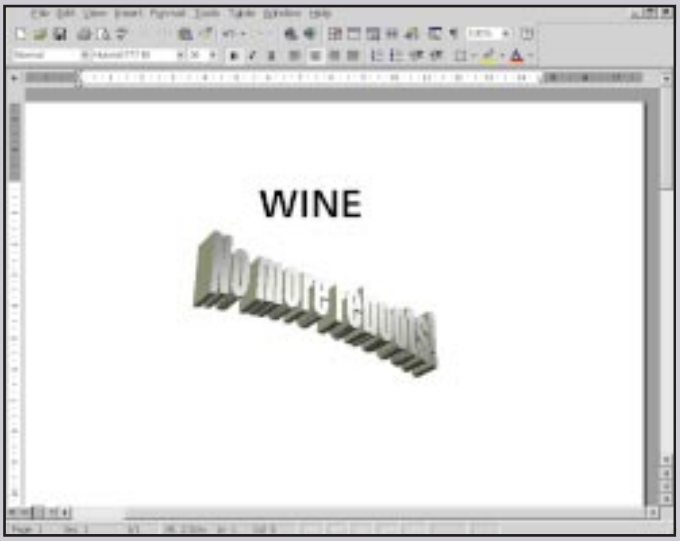
```
export PATH=$PATH:/mnt/windows/windows
```

and if you want that to be automatically performed each time you login, place that command in the '.bashrc' file in your home directory (assuming you use the bash shell). If you want more information about WINE such as documentation, mailing lists, updated snapshots and so on, visit www.winehq.com.

FORUM **www.pcplus.co.uk/forums/linux**



↑2. WINE's built-in desktop is a good way of keeping windows consistent with Windows and Linux.



↑3. It's seven years since the project started and WINE has come a long way – Microsoft Word works almost flawlessly.

Your Linux questions answered

Got a Linux query? Our expert **David Coulson** is on hand to solve your problems

RealPlayer problems

Q **I downloaded and installed RealPlayer 7 last night. The problem is that when I try to run it as a user it tells me that it cannot open the audio device, and that another application may be using it. I have discovered that if I [su] to root then start RealPlayer it will make a noise, so I suppose it's a permissions thing.**
Zagon Linfoot

A You'll have to use chmod to set the permissions of /dev/dsp to allow non-root users to write to it. You can achieve this via

```
chmod 666 /dev/dsp
```

You may also find that you are unable to access your audio device if you have a sound daemon, such as EsounD running on your system which holds the /dev/dsp device, stopping others from using it.

ESD has a little utility called esdctl which you can use to manage the daemon. esdctl off will stop esd controlling the /dev/dsp device, so you can use RealPlayer. esdctl on will turn it back on. While esd is turned off, any applications that send sound to it won't fail, they just won't make any noise.

KDE vs Windows

Q **Running simple applications (kedit, kcdplayer and so on) under KDE is at least four times slower than running similar tasks in Windows 95 on the same machine. That's not to mention the poor resolution I get from my graphics chip. The resolution problem makes more sense because it is an old Tseng ET4000/W32 chip but it looks perfect under Windows.**
Paul Richards

A You'll probably find you have quite a lot of other processes running behind the scenes, such as Apache, sendmail and the like, which you don't really need.

Remove them using the package manager from your distribution and you should hopefully notice a marginal improvement in speed. You may also want to stop a lot of KDE apps running when you login and opt for a more efficient window manager, such as IceWM, Sawfish or Blackbox. Remember, you don't need to run kpanel or the KDE session manager to use KDE programs. If your video card is not configured correctly, it might be a good idea to check for any hints as to which X server you need to be using or any options which can improve performance or the range of resolutions available. As always, www.xfree86.org make sure you are running XFree86 3.3.6.

Accessing the Web

Q **When I launch KPPP, and it connects properly, Netscape gives me some error about not being able to find the server. I cannot access any Web site and it's not just Netscape, I cannot access the Internet in any program. What do I do?**
Alex Sumerton, Lancaster

A KPPP has the option of receiving the DNS server IPs from your ISP when you login, rather than letting you manually specify them. However, that doesn't always work, so you'll have to set them in /etc/resolv.conf. Check your ISP's Web site or see which DNS servers it uses in Windows or under a functional Linux dialup. You should have two IPs, as one will be used for backup if the first fails. Open /etc/resolv.conf in a text editor as root and enter:

```
nameserver aaa.bbb.ccc.ddd
nameserver eee.fff.ggg.hhh
```

You should immediately be able to access the Internet properly.

FORUM **www.pcplus.co.uk/forums/linux**

Iomega Zip drives

Q **In your instructions for installing an Iomega 250 Zip drive, you mention loading the imm module using the modprobe command, which works but I have to do this every time I restart the system. Is it supposed to work like that or can I permanently install it using the insmod command.**
Martin Peterson, Kent

A You should never really use insmod from the command line, other than to force the installation of a module. If you selected automatic loading of modules in the kernel configuration, it should automatically load the imm module when you try to access the /dev device which is for the Zip drive. If it still doesn't want to work, you could add modprobe imm to the end of /etc/rc.d/rc.local, which will cause the module to be installed when the machine boots up.

RedHat on Windows

Q **I am running Red Hat 6.0 on a machine whose day job is a Win98 system. There are a few services I run by hand each time I boot the Linux OS, true type font servers and so on. I've never figured out properly how to automate them. I tried a sys v initialisation file but that locked the boot solid. I would appreciate some newbie style intro to sys v or an alternative way to run services on start up.**
Mark Wilkinson

A On Red Hat systems the scripts which start or stop the various services are located in /etc/rc.d/init.d/. On other systems they may be in /etc/init.d/. These scripts are fairly straightforward and take simple 'start, stop, restart, status' arguments. If you take a simple example, such as the one that launches atd, you could hack it to load or kill whichever service you're interested in. To make the service

run at start-up you need to set it up to start when the machine enters the default runlevel (usually 5 if you have a graphical login under Red Hat). If you look in /etc/rc.d/rc5.d/ you'll notice a lot of files with names like S10atd which is symlinked to ../init.d/atd. Rather than duplicating the whole script or putting a command in a script, the init process looks in /etc/rc.d/rc5.d for everything beginning with a K, in numerical order, and does filename stop. If you had K10atd and K40crond, it would stop atd first, then crond. It then looks for everything beginning with an S and does filename start.

Monitor drivers

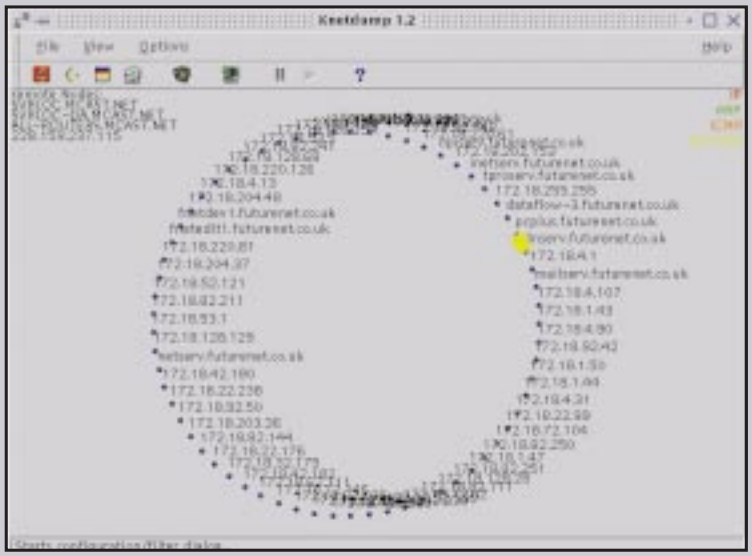
Q I had gathered from the Windows 98 device manager that my monitor is an SV3 Trio64 V+ PCI(765), Super VGA 1,024 x 768 @ 75Hz. The closest match I could find to this in the list presented by the Linux installer was Super VGA 1,024 x 768 @ 70Hz. It seemed okay at first, then the screen was filled with vertical lines about 1.5 cm apart. It also totally hung the keyboard and mouse.
Sarah Giatsu

A First, the 'SV3 Trio64 V+ PCI(765)' refers to your graphics card, not your monitor. Second, if you want to get the best possible resolution from your display you really need to put the specific horizontal and vertical frequencies for your monitor into the XF86Config file, rather than relying on a similar specification. These will be in the manual that came with your monitor or, failing that, the web site of the manufacturer. If it is a re-badged monitor you will need to go to the site of the company who built your machine. Also ensure that you are running the latest version of XFree86. Any bugs that exist in the X server for your card that could be causing lockups may have been removed. It's probably not best to try XFree 4.0 yet. PCP

Dave Coulson
dcoulson.pcpmag.co.uk

We can help!

→ Got a Linux problem? We can't answer questions privately but we're pleased to answer your questions through these pages.
→ E-mail your questions to: Linux Q&A at dcoulson@pcpmag.co.uk and we'll try to help. Alternatively, send them to Linux Q&A, PC Plus, 30 Monmouth Street, Bath BA2 3BW.



↑knetdump is a packet sniffer and analyser for visualising the basic protocols of the OSI layer 1-4. It can show the headers, connections on the Net, and a tcp-connection between two hosts. You can download it from http://freshmeat.net/redir/homepage/934508293/.

↑KSniffer is a network statistics collector. It supports most TCP/IP protocols, (TCP, IP, UDP, ICMP, ARP, RARP as well as minimal IPX). The application reports on traffic in bytes or packets, activity (kbits/sec, kbytes/sec, packets/sec), as well as by protocol (http, irc, etc). You can download it from http://freshmeat.net/redir/homepage/917864115/.

→ Network settings in kernel 2.4

How to go about packet filtering for kernel 2.4 using netfilter

With the availability of 2.4.0-test1, and no doubt an even more improved and cleaned up release by the time you read this, we are faced with yet another networking overhaul, especially where our firewall is concerned. Although 2.4 provides an ipchains compatibility module, netfilter – via the use of iptables – opens the door to more complex and effective rules.

The basics of iptables

As with ipchains, we have three main chains for packet filtering, INPUT, OUTPUT and FORWARD (note the capitalisation). We can set our default target for each of the chains with

```
iptables -P INPUT DROP
iptables -P FORWARD DROP
iptables -P OUTPUT ACCEPT
```

DENY in ipchains has been replaced with the far more descriptive DROP. DROP literally just drops the packet without sending a ICMP packet back to the source saying it can't connection (as with REJECT).

We can then begin to allow packets for services such as DNS and ident.

```
iptables -A INPUT -p udp –
sport 123 –dport 123 -j
ACCEPT
iptables -A INPUT -p tcp –
sport 53 –dport 53 -j
ACCEPT
```

Unlike ipchains, we don't have to specify a source or destination address if it's just going to be 0.0.0.0/0.0.0.0 (aka anyone).

In ipchains we just had to allow everything from port 20 if we were going to have normal ftp to work, but thankfully we don't have to resort to such drastic measures with iptables. iptables has connection tracking for a number of protocols built in, so we can tell it to only allow in packets that are associated with our ftp connection.

```
iptables -A INPUT -p tcp –
sport 20 -m state –state
RELATED -j ACCEPT
```

The '-m' flag tells iptables that for the rule to be true, the packet must match a specified state, in this case that it's related to another active connection. This way, we can control almost all incoming connections without having to open most of our ports, simply by checking that they belong to another connection.

Logging and notification

The logging of packets has changed drastically. Previously, you'd just add a '-l' to the end and whenever that rule was true, it'd be logged. Now, logging is a target independent of the rest.

```
iptables -A INPUT -p tcp –
dport 0:1023 -m limit –
limit 10/min -j LOG
```

We've also added a 'limit' match too, so it will only log ten packets per minute, so we won't have any attacks that will eat up our disc space via syslog.

Masquerading and NAT

The use of masquerading has changed very little in iptables, although we now insert the rule into a completely different type of chain. As well as the three normal chains, we now also have a separate table called 'nat' containing PREROUTING, OUTPUT and POSTROUTING. For simple masquerading we only need concern ourselves with the latter chain.

```
iptables -t nat -A
POSTROUTING -s 10.0.0.0/8
-j MASQUERADE
```

We can also do mapping of connections entering our network. If we wanted all http connections to our firewall to be handled by a machine, say 10.1.1.5, we could rewrite the packets with a rule like

```
iptables -t nat -A
PREROUTING -p tcp -d
gw.domain.net –dport 80 -j
 DNAT –to 10.1.1.5:80
```

Where to go from here

To keep up to date on netfilter/iptables releases and patches, or for a more in-depth look at many of the concepts covered here, check http://netfilter.kernelnotes.org.

Windows Networking: PART FIVE

NetMeeting's hidden talents

You may think it's just for chatting on the Net but take a closer look at Microsoft's NetMeeting. **Paul Warner** discovers some hidden gems

We'd always looked at 'Net Meeting' and relegated it to Microsoft's alternative to Internet Chat. In fact, when it was first mooted that we include an article on it, the first comment from the team was "Haven't Microsoft dropped it in 98?" Well, be prepared for a pleasant surprise.

Not only is NetMeeting still alive and well in 98 but it's been improved in version 3 and has some sophisticated features that considerably extend its capabilities.

Overview

At the simplest level, NetMeeting is a Windows conferencing tool that enables users to communicate with each other over the Internet or a local intranet. The International Telecommunications Union (ITU) has agreed a set of standards (H.323 & T120) for audio and video conferencing, and NetMeeting complies with both of these.

→Web info on NetMeeting

We've collected a few useful addresses for info on NetMeeting – find out some of the new ideas on how to use it

www.netmeet.net/

http://looksmart.remarq.com/

www.netmeet.net/nmse.asp

www.nll.co.uk/netmeeting/

www.shenton-orchris/nasa-hq/netmeeting/

www.meetingbywire.com/NetMeeting3.htm

The basic components of NetMeeting fall into three areas:

Data conferencing

Once a conference is set up over the Internet or local Intranet between two or more people, users can share information and data in real-time. They can share applications and work together with each member able to see the same information on their screens – every one can chip in and make adjustments or alterations at the same time. Using a common 'White Board', each participant can sketch ideas, make modifications and comments to a shared drawing board.

Files can be sent between members and a built in chat box can be used to send written messages between members.

Video conferencing

Provided that you've fitted a graphics card that has video capture facilities and have a camcorder or digital camera, users of NetMeeting are able to send and receive video images. Combine this with the built-in audio facilities and you can use NetMeeting for face-to-face communication between members of a conference or one-to-one.

Internet telephone

If you have a microphone, sound card and speakers, then you can use NetMeeting to contact and talk with people over the Net. Arrange a meeting with your Great Aunt in Wanga Panga and you could talk all day, half way around the world, for the cost of a local call charge. As soon as local calls are removed, worldwide telecomm could become completely free. No wonder BT is rattled.

Installation

NetMeeting is usually installed by default in Win98. If you look in Start›Programs›Accessories›Internet you should find it. If not you may have to go to Add-Remove programs in the Control Panel and add it as an extra Windows program. The latest version is 3.01 and this can be downloaded from www.microsoft.com the Microsoft site – try the **windows/netmeeting/download/Win32x8630.asp** file.

In this case, you just run the downloaded executable file and it will install into Windows. It's when you start NetMeeting that you enter the main part of the installation. Take a look at our walkthrough which gives you an idea of the step-by-step procedures. It's straightforward enough and once you've entered your details, server name and tested your environment, you should be ready to conference.

We'll take a closer look at the individual features next month but this basic installation should get you up and running. You'll be able to log on to a server on the Internet or a computer on your local intranet and set up a conference. Numerous NetMeeting servers are available on the Web.

The default one is Microsoft's but if you have a hunt, you'll fine that there's a wide choice, suitable for every taste. We've included a selection for you to try but can't guarantee the content of conferences. Most of the reputable servers attempt to stay free of distasteful content but check them out before you select one.

By default, NetMeeting looks for a server over an Internet connection. You can modify this to look for another computer on your local Net. First, you'll need to un-check the 'Log on to to a directory server when NetMeeting starts' box. If you open the tools menu, you'll find this under the General tab in the Tools option. This will stop NetMeeting trying to find a server at start up.

Next, you need to adjust your bandwidth settings. To do this you go into the same options menu and select the bandwidth button, it will open up a choice of speeds from a 14,400bps modem to LAN.

If you're working on a LAN, then to connect and conference with other users, you'll need the specific IP address for each member. This is easy enough if you're running under NT but in Win98, peer-to-peer networking, IP addresses are not so easy to find. Windows will install the network protocols and automatically assign addresses to individual machines. You'll need this specific information to conference with another computer on the network. The simplest way to find out the IP address is to run the help menu in NetMeeting. Open up 'About Windows NetMeeting' and at the bottom of the box is a set of eight numbers. The last group of four separated by full stops is the IP address for your particular machine.

You can add individual users to the built in address book and check for contacts on network servers, or over the Internet. This basic installation should be enough to get you up and running at the simplest level. Next month we'll take a look at some of the more sophisticated features including Remote Desktop sharing, installing video cameras and control of remote computers. You could sort out a problem with someone's machine over the Net, which is ideal for technical support. We would recommend downloading the latest version from Microsoft. It's under a couple of MB so shouldn't take too long. Version 3.01 supports improved security and is easier to share with other users. PCP

Paul Warner
pwarner@pcpmags.co.uk

FORUM www.pcplus.co.uk/forums/windows

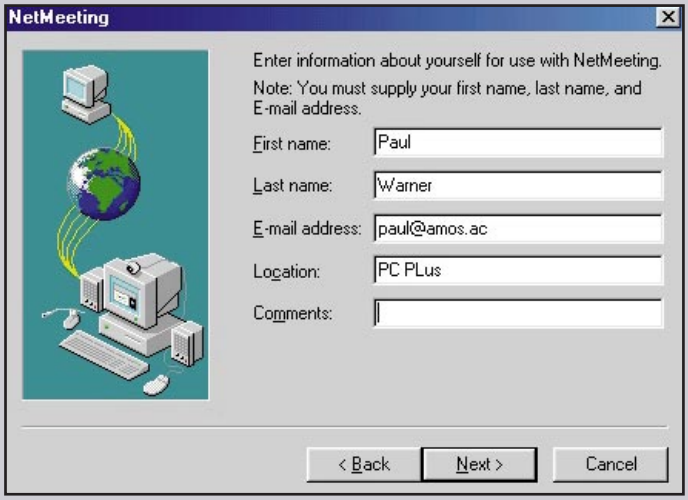
PCPlus NEXT MONTH

We look at Remote Desktop sharing, and installing video cameras

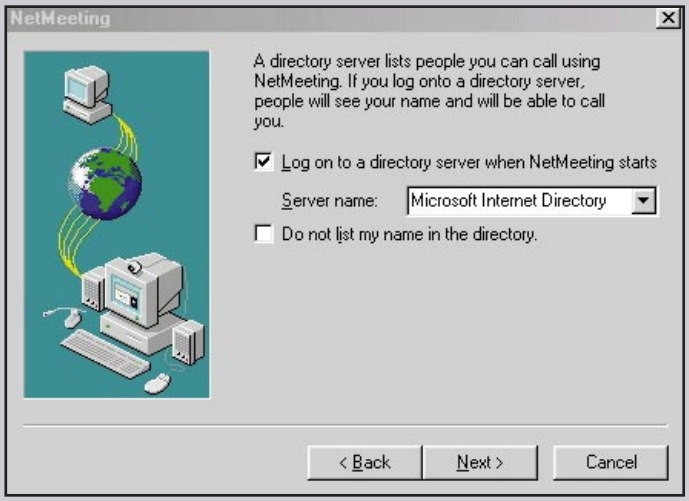
Getting started with Microsoft NetMeeting

NetMeeting isn't a 'switch and go' application. Here's a brief guide to get you started

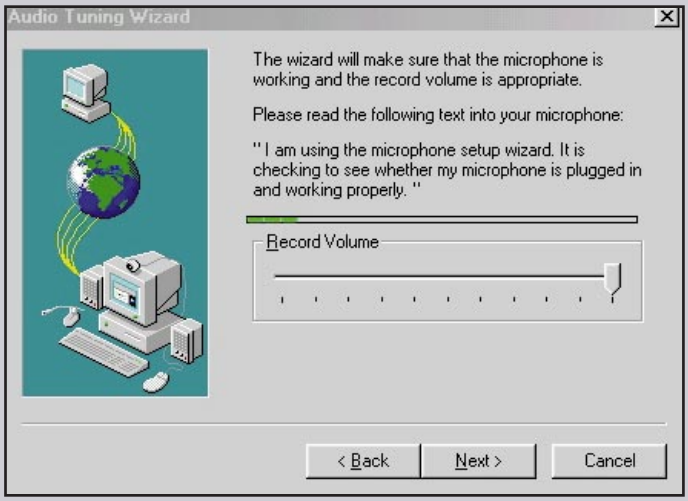
1 When you use NetMeeting for the first time, a simple systematic wizard takes you through the installation procedure.



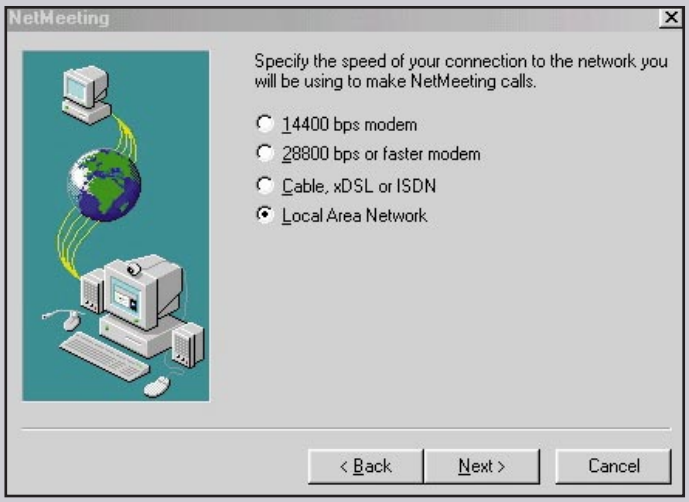
2 First, you'll be asked for your name and e-mail details. Your name is the only required information. This will identify you to other NetMeeting users.



3 When you first open NetMeeting, you can automatically log on to a directory server. By default, this is the Microsoft Internet Directory. If you're planning to use it over an Intranet, it's probably best to leave this un-ticked.



4 You'll be asked to test the sound and recording levels. This sets up NetMeeting for telephony use and conversation in a conference. If you intend spending a lot of time on NetMeeting, you'd be wise to invest in a headset and have your hands free for keyboard and mouse.



5 From inside the Tools menu select options to adjust the connection speed to suit your specific system. To do justice to NetMeeting you do need a fast connection. At speeds less than V90 you'll probably find you are hanging around waiting.

6 You should now be able to start NetMeeting and open or access conferences on either the Net or your own local intranet. Chat, whiteboard and file transfer are available. Add a camera and sound card to try out full blown video conferencing.

WAP secrets: PART TWO

Building faster WAP pages

Slow WAP sites cost users money and puts them off returning. **Simon Bisson** shows how WAP scripts can speed them up

The mobile Internet is growing faster than the original Web. Cellnet has predicted over 500,000 users of its Wireless Application Protocol (WAP) services by September 2000, and are working with the Halifax's Internet bank IF to provide 150,000 WAP phones to the bank's subscribers. Even the normally staid *Financial Times* has given away Motorola WAP phones to subscribers to the FT.com Web site.

Last month we looked at how to add simple WAP-ready pages to your Web site, and created a basic WAP deck with a variant of the good old 'hello world' script. The Wireless Markup Language (WML) used by WAP is similar to HTML, and it's no surprise to find that it comes with a simple scripting language based on the ECMA-262 standard – the same root as JavaScript.

WMLScript is an important feature of any WAP browser implementation, as you can run simple applications directly on the phone – and there's not much new to learn if you've already worked with JavaScript.

So what can you use WMLScript for? Most large WAP sites will use it to take the load off a Web server – and off WAP's slow 9,600 bps connections. If you can validate a user input on the phone without having to go from the handset to the WAP gateway, to the Web server to the application server (and all the way back again!) your WAP services will not only be faster, they'll also be a lot cheaper to use, especially with WAP calls in the UK charged at between 5p and 20p a minute. But this isn't the only use for WMLScript, we've seen everything from games to currency converters that don't need complex Web applications behind them – just a few lines of WMLScript running on a phone.

The basic functions of WMLScript are found in six libraries:

- Lang: The core functions of WMLScript.
- Float: A set of typical arithmetical floating-point functions that are frequently used by applications.
- String: A set of string functions.
- URL: A set of functions for handling absolute URLs and relative URLs.
- WMLBrowser: Functions that WMLScript uses to access the associated WML context.
- Dialogs: A set of typical user interface functions.

These make it possible to add extra functions to your WML pages. If you want to understand these in more detail, download the Nokia WAP Toolkit and read the WML Script reference manual.

So how do you include WMLScript in your WML decks? As a quick example we create a WML deck that will roll a die, and give you a result from 1 to 6. (See **Code Corner**, **WLM cards** opposite).

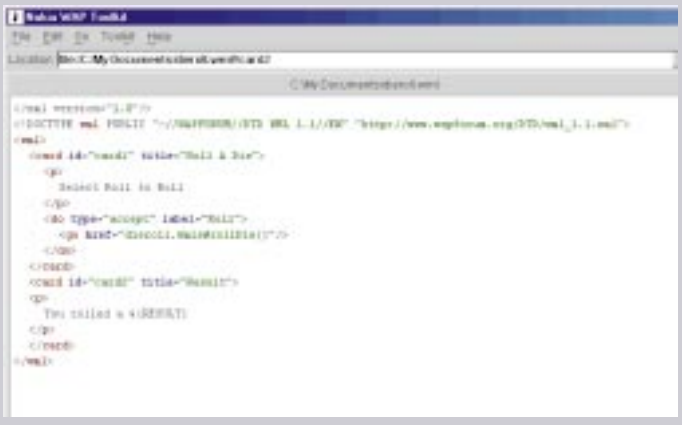
This is a simple two-card deck. The first calls an external WMLScript document when the 'Roll' soft key in the phone is pressed, while the second returns a result and displays it on your phone's screen. Save the file as 'dieroll.wml'.

The ‹do› block used to call the script is very much like the card navigation blocks we used last month. However, it doesn't actually call a new card – this function is left to the WMLScript. The structure of the ‹go› statement is important:

```
<go href="dieroll.
wmls#rollDie()"/>
```

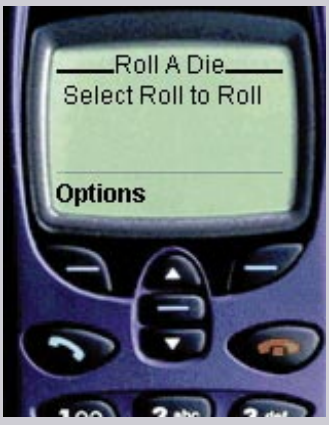
WML Script in action

How to turn code into a mobile phone application



1 You can use the Nokia WAP toolkit as a development tool as well as a test bed for your WMLScript applications. Here we've used it to create the WML pages for our test application.

2 As well as editing WML, you can create WMLScript in the WAP toolkit. Like all good IDEs it will colour-code your script's syntax, and enable you to test your pages. You can run any individual function from a script – helping you track down bugs.



3 Here's our example script running in an emulated Nokia 6150 WAP phone. With this handset you need to select the 'options' menu before rolling the die. It's not very clear what you should do here – a common problem with WAP applications.

Here we're calling a specific function – rollDie() – in a script, dieroll.wmls. The '#' in the href link enables you to target a specific function in a script, so a single script can contain multiple functions, saving you from connecting to the server every time you need a script in your application. The script we're using to roll the die uses two of the core WMLScript libraries. See **Code Corner, WMLScript libraries**.

This is a simple piece of code, but it shows the syntax of a WMLScript application.

First we initialise a function, in this case 'rollDie()'. This is the function we called from the WML deck. It doesn't return any values, as it controls the content of the card it calls. If you want to return specific values or give your function inputs you need to include them in your call. We could turn this into a generic multi-sided die by having a function rollDie(s), called as rollDie(20) if you wanted a 20-sided die rolled...

We then declare two variables for use in our application. WMLScript requires that all the variables are declared – but doesn't mind what type they are! If you're used to more complex languages like Java you'll find this a little undisciplined, but then again, WMLScripts will be rather short!

A core mathematical function is called. Lang.random(var) returns a number between 0 and your chosen value. As we're writing a WAP application to throw a die, we set this to roll a number between 0 and 6. This will return any of 0, 1, 2, 3, 4 and 5. We'll need to convert this result into a number between 1 and 6. We could add 1, but to make our application a little more complex we'll use an 'if...else if' block to turn the value into text. WMLScript comes with comparison operators to create logical statements.

Once we've generated a string containing the number 'rolled', we need to display it on our phone's screen. The WMLBrowser library controls the micro-browser in your handset, and can set internal variables and call pages. Our script uses these functions to set the WML variable RESULT to the value of the die roll, and then calls the second card in our deck using the WMLBrowser.go function. This has already been written to display the RESULT string.

Code Corner

WML Script libraries

The libraries in action

```
extern function rollDie() {
      var r, roll;
      r = Lang.random(6);
      if (r == 0) {
            roll = "One";
            }
      else if (r == 1) {
            roll = "Two";
            }
      else if (r == 2) {
            roll = "Three";
            }
      else if (r == 3) {
            roll = "Four";
            }
      else if (r == 4) {
            roll = "Five";
            }
      else if (r == 5) {
            roll = "Six";
            }
      WMLBrowser.setVar("RESULT", roll);
      WMLBrowser.go("dieroll.wml#card2");
}
```

Code Corner

WML cards

Roll a die on your mobile

```
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN"
"http://www.wapforum.org/DTD/wml_1.1.xml">
<wml>
      <card id="card1" title="Roll A Die">
            <p align="center">
            Select Roll to Roll
            </p>
                  <do type="accept" label="Roll">
                  <go href="dieroll.wmls#rollDie()"/>
                  </do>
      </card>

      <card id="card2" title="Result">
            <p>
                  You rolled a $(RESULT)
            </p>
      </card>
</wml>
```

You can run these samples in a WML development tool like the Nokia WAP toolkit before you install them on your Web server. It's a good idea to do this, as there's little in the way of debugging tools built into a phone. Testing in a phone emulator will throw up any typing mistakes you've made and as WML is an XML-based language, any errors will mean that a deck won't be parsed by a WAP Gateway, and so will never be compiled and sent to a phone.

Powerful tool

WMLScript is a powerful tool, and this overview only scratches the surface of what you can do with WMLScript in your WAP applications. The tools that enable you to interact directly with a WAP micro-browser are especially useful – and they're not the only way you can control your phone. One of the more interesting features of WMLScript is the Wireless Telephony Application Interface (WTAI). This is a tool that enables your scripts to control your phone directly. With WTAI you can dial calls, add numbers to the phone book – all with a few lines of WMLScript.

There is one big problem with WTAI: not all phones support WTAI in the same way. Some allow scripted access to WTAI functions, while others use custom WML tags. So a page designed for a Nokia phone won't work with a Motorola – making it impossible to create cross-platform pages that use complex features. It's difficult to know what to do here, and it's probably best to leave WTAI well alone until Phone.com, Nokia and Ericsson get their acts together.

If you want to learn more about working with WAP and WML, you can download any of the WAP toolkits from Nokia, Motorola, Ericsson or Phone.com. Nokia provides an excellent guide to WMLScript among its files.

For those of you who find WAP and WML worth exploring in detail, there's only one text book available: Steve Mann's *Programming Applications With The Wireless Application Protocol: The Complete Developer's Guide*. This is an excellent book for everyone from the beginner to the experience developer who wants to use Java Servlets to deliver dynamic WML pages. PCP

Simon Bisson
www.sandm.co.uk

→MExE – Java on a mobile

The next steps in programming a phone

→MExE (Mobile Station Application Execution Environment) is intended for the next generation of mobile networks. These will be based on two new technologies: GPRS, the General Packet Radio System, and W-CDMA, Wideband Code Division Multiple Access. GPRS will turn existing GSM phone networks into high-speed packet networks, capable of speeds between 30Kbps and 300Kbps. W-CDMA is the technology behind the future 3G wireless networks that just raised £22 billion for the UK Government, and can run at speeds of up to 2Mbps.

MExE is supported by most of the main mobile hardware developers, including Nokia and Motorola, as well as network specialists Nortel. It'll be some time before we see powerful enough handsets for MExE to become widely used, but to get you started you can find out more from: **www.mobilemexe.com/** and from **www.etsi.org/smg/smg4/mexe.htm.**

Unlike the Wireless Markup Language Script, which is not a full programming language, MExE is a complete programming environment for mobile devices – almost the 'next generation' of WAP.

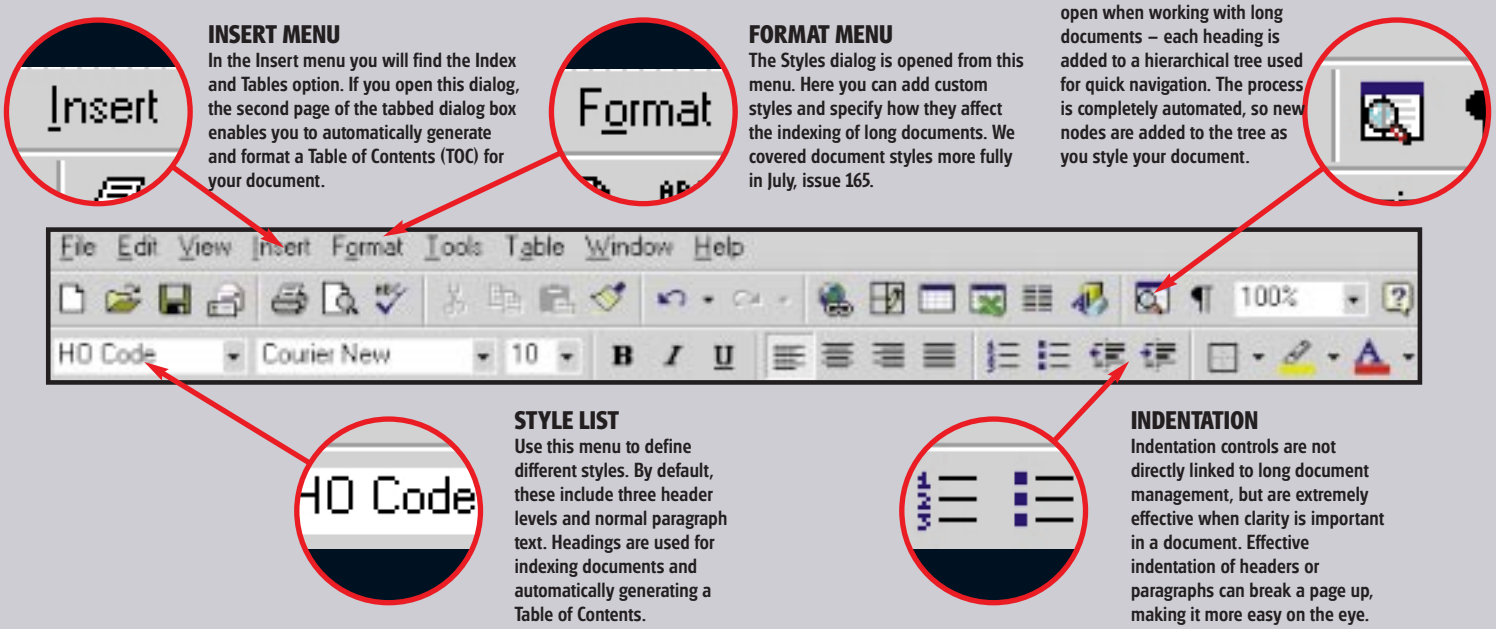
PCPlus

NEXT MONTH

How to add graphics to your WML decks

Word2000 tools you'll need to use

There's a load of functions for formatting long documents



INSERT MENU
In the Insert menu you will find the Index and Tables option. If you open this dialog, the second page of the tabbed dialog box enables you to automatically generate and format a Table of Contents (TOC) for your document.

FORMAT MENU
The Styles dialog is opened from this menu. Here you can add custom styles and specify how they affect the indexing of long documents. We covered document styles more fully in July, issue 165.

DOCUMENT MAP
This is a very useful tool to have open when working with long documents – each heading is added to a hierarchical tree used for quick navigation. The process is completely automated, so new nodes are added to the tree as you style your document.

STYLE LIST
Use this menu to define different styles. By default, these include three header levels and normal paragraph text. Headings are used for indexing documents and automatically generating a Table of Contents.

INDENTATION
Indentation controls are not directly linked to long document management, but are extremely effective when clarity is important in a document. Effective indentation of headers or paragraphs can break a page up, making it more easy on the eye.

Office 2000 at work: PART SEVEN

Making long documents easier to read

When you move from single page documents to longer ones, you need a whole set of new Word skills. **Helen Bradley** takes you through them

Working with long documents is more taxing as the writer because you can't see it all on the screen in one go.

If you frequently work with long documents, you'll find that the tools for creating and moving around long documents can make it easier.

In addition, to make your printed copy more 'reader friendly', you'll need to add elements to your document which you may not use on shorter documents. These elements include headings to break up the text into logical sections and tables of contents and page numbers to help your reader find information in the document.

Header and footer basics

In this article I'll show you some of the basic Word 2000 tools for working with long documents.

Most of these work similarly in Word 97 and, if you're using another word processing package you'll find it should have these tools, too.

Headers and footers are valuable tools for formatting long documents. They enable you to place text and page numbers on every page of a document automatically. You type the text once in either the Header area or the Footer area and it will automatically appear on every page of the document.

Using headers and footers saves you a lot of time. If you place this information in the document yourself and then need to change the document by adding or removing text, you'd run into layout problems which could take too much time to fix.

In contrast, Header and Footer text is managed by Word, independent of the remainder of the document. You can change the document any time you like without affecting the text in the Header or Footer and without needing to make any changes to them.

It is common for the title of a document to appear in its header and for the page numbers to appear in the footer.

To access the Header and Footer areas, open a document which has more than one page of text and choose View, Print Layout (in Word 97 it is called Page Layout). This mode will show what your document will look like when it is printed, with all of the page furniture included.

Choose View, Header and Footer and you'll see the Header and Footer toolbar on the screen. You'll be positioned inside the Header

Quick Tips

GETTING THE MOST FROM HEADERS AND FOOTERS

Most people just stick a name and a page number on them, but a good use of headers and footers can save lots of time

➔Never lose another document. Put its filename in the document footer. Choose View, Header and Footer, and move to the footer by choosing the Switch Between Header and Footer button.

Choose Insert AutoText and select Filename from the menu – to add the filename and path, choose Filename and Path.

➔Where am I in this document? If you use the Page x of y option to add page numbers to a document, your reader will always know where they are in the document. Choose View, Header and Footer, and move to the footer. Place the cursor where the page numbering should appear and choose Insert AutoText, Page X of Y.

➔Find and replace in headers and footers: If you find that your Find and Replace function isn't searching your documents headers or footers you can force this to happen. In the Find or Find and Replace dialog, click More and from the Search drop-down list choose All.

➔Working in Word's Print Layout view You can quickly move to any existing header or footer in the document by double-clicking in the header or footer on the screen. To exit the Header and Footer area, double-click anywhere outside the header or footer area to return to your document.

➔Formatting a header or footer. Headers and footers are formatted using the Header and Footer styles which are the same as Normal Style. You can change these by selecting Format, Style, choose the style to change and click Modify, Format, Font. Make the changes and click OK.

↓Creating a footer like this is easy with the AutoShapes tool and the page numbering options in Word.

↑The Captions option enables you to add captions to figures, tables and so on, and to cross-reference them in your document.

↑The Document Map is a handy way of moving through long documents by clicking a heading in the list on the left of the screen.

area which is bordered with a dashed line. You can switch to the Footer area if you select the Switch Between Header and Footer button on the Header and Footer toolbar.

To add the page number in the footer, position the insertion point where the number is to go. There are two preset tabs; at the centre of the page and at the right margin to make this easier for you.

Now click the Insert Page Number button on the toolbar. Always use this button because it inserts a special code (called a Field Code) into the document which tells Word that the page number should go here. If you simply type the number 1, for example, you'll just get the number 1 on every page!

If your computer shows the code {Page} in place of the actual page number you have Field Codes display turned on. You can turn this off by pressing [Alt] + [F9].

More fancy page numbers

You can add symbols around your page numbers so they don't look so plain, for example you can format them to look like '– Page 2 –'. Do this by adding text either side of the page number that Word inserts for you – you can also select the page number and any text you've added to it and format it using your choice of text formats.

You can also get some interesting effects very easily if you use the shapes on the Drawing toolbar to add backgrounds to your numbers. Display the Drawing toolbar using View, Toolbars, Drawing and choose a shape (oval, rectangle or an AutoShape) and add the shape to your document. Select a Fill Color and Line Color to suit and then right-click the shape and choose Add Text. Click the Insert Page Number button and then highlight the number that Word has inserted and format it to your desired font, size and colour using the font tools on the Formatting toolbar and the Font Color button. Choose the Center alignment button on the Formatting toolbar to centre the number inside the shape.

When you're creating a fancy footer like this you may need to increase the size of the Footer area so it is large enough for the shape to appear within its boundaries. To do this, ensure the ruler is visible (select View, Ruler) and use your mouse in the vertical ruler to drag the upper boundary of the footer area further up the page.

Alternatively, click the Page Setup button on the Header and Footer toolbar, select the Margins tab and increase the Footer setting.

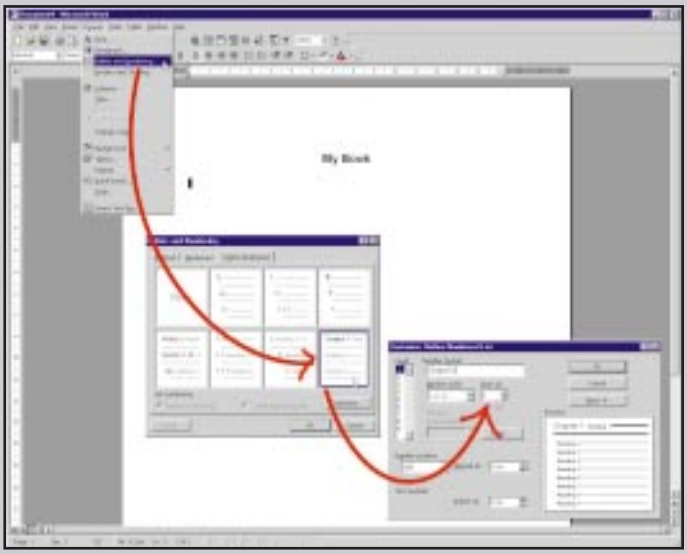
Different first page

When you're creating a title page for your document, you'll want the first

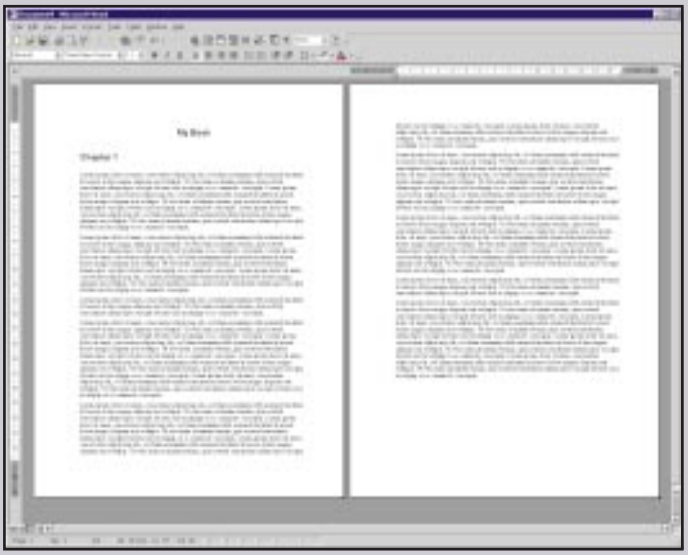
FORUM www.pcplus.co.uk/forums/windows

Creating chapter numbers

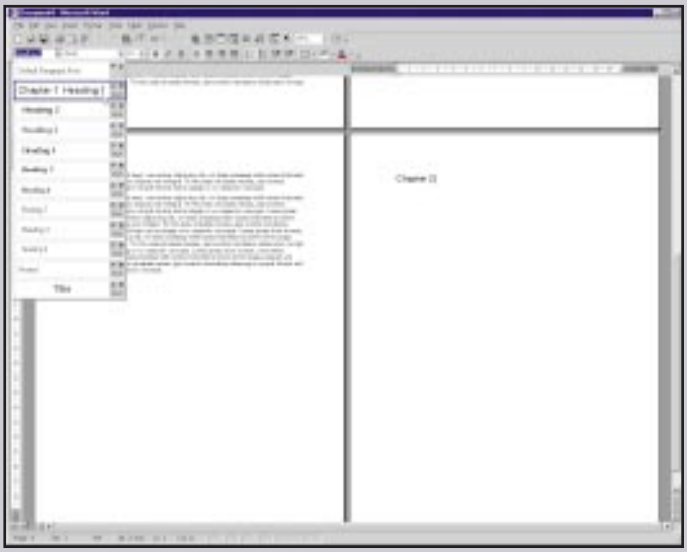
Here's how to create a document with consecutive page numbering which displays the current chapter number, too



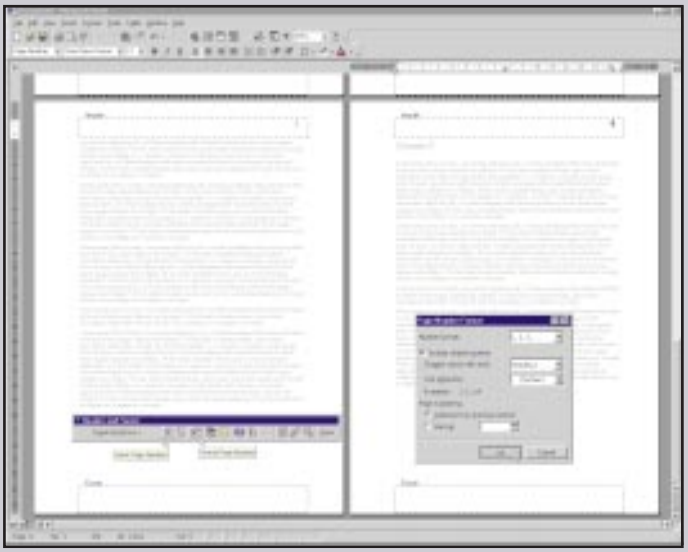
1 Open a new document and type a title, for example My Book. A few lines down the page, add a chapter number by choosing Format, Bullets and Numbering, Outline Numbered tab. Choose the bottom right option and click Customize. Set the Start at: number to 1 and click OK.



2 Your document will now show the heading Chapter 1. Add some text to your chapter and, when you are ready to start chapter 2, press [Control] + [Enter] to begin a new page.

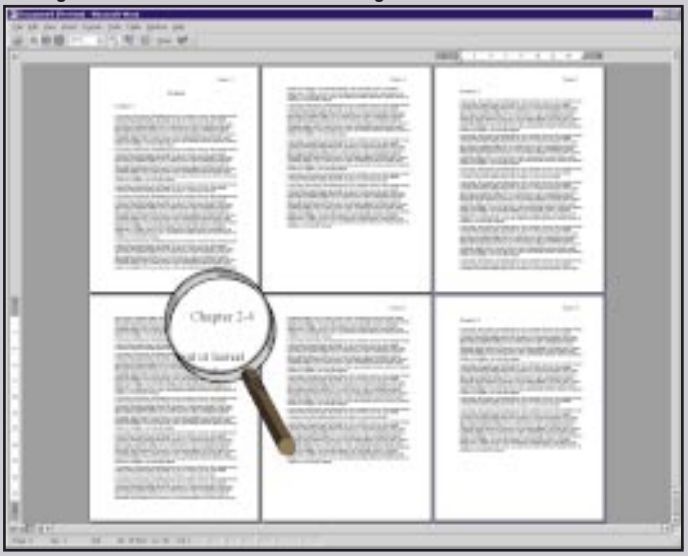


3 When you're ready to start chapter 2, begin at the top of the new page. Press [Ctrl] + [Alt] + 1 (or select Heading 1 style from the Style box) to insert the chapter number automatically in your document. Continue adding text and chapters to your book.



4 To create the page numbers in the header, choose View, Header and Footer and choose Insert, Page Numbers. Click the Format Page Number button and enable the Include Chapter number checkbox. The 'Chapter starts with style' entry should be Heading 1 so select OK. You'll find the numbering has been inserted inside a text box.

5 Click in the frame that's been inserted, move your insertion point in front of the number itself and type 'Chapter'. Press the Space Bar once and then click Close to return to your document.



6 Choose File and Print Preview to view your document. Notice that the pages are all numbered sequentially throughout the document and each page number is prefixed by the current chapter number.

Breaking up a long document

Here are some typical elements you should include in a long document

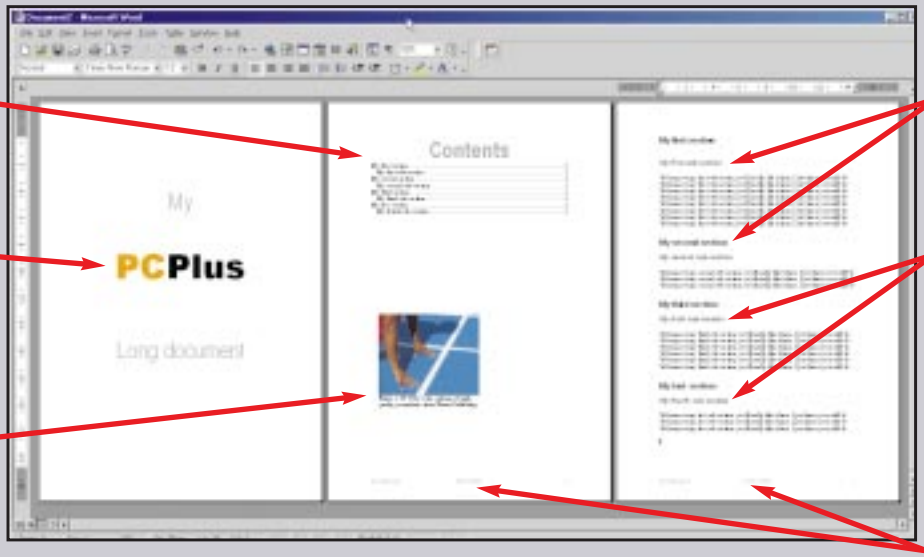


TABLE OF CONTENTS
This enables a reader to find their way around the document more easily

TITLE PAGE
This page has no numbering and it is used as a cover page for the document.

FIGURE AND CAPTION
The illustrations and other images in the document should have captions describing their contents

LEVEL 1 HEADING
The main headings in the document are all Level 1 headings.

LEVEL 2 HEADING
The second level headings break up each main heading into separate parts

THE FOOTER INFORMATION
Includes the author's name, the date and the page number

page to be free of any header or footer text. You can do this from in the Header and Footer area if you choose the Page Setup button on the Header and Footer toolbar. Choose the Layout tab, enable the Different First Page checkbox and click OK. Move to the second page of the document to create the header and footer for the remainder of the document.

If you'd like the actual page numbering to begin on the second page of the document (but for this to read page 1) then you format the page number. In the footer, select the page number and click the Format Page Number button. Set the Page numbering: Start at setting to 0. Now, the second page of the document will be numbered 1.

Headings

If you're creating long documents you should break up the text using headings. The simplest way to do this is to format each heading using a style. If you use the built in heading styles Heading 1, Heading 2 and so on, you'll find it easier to create a table of contents for your document, too.

To apply a style to a heading, select the text of the heading and choose the style from the Style drop-down list on the Formatting toolbar. If you can't see a style you are looking for, hold the [Shift] key as you click the drop-down list to display the full list of styles.

You can change the way a style looks by choosing Format, Style, choose the style name from the list and choose Modify, Format and then choose an option such as Font to change the font face of the style.

The Document Map

A side benefit of using styles for formatting your document is the ability to use the Document Map to move around it. To see the document map choose View, Document Map. The screen will change to show a list of the headings in your document down the left of the screen. You can select any heading to move automatically to that part of the document.

Table of contents

A second side benefit of using heading styles is the ability to create a Table of Contents very quickly. To do this, place the insertion point in the document where the Table of Contents is to appear – usually towards the beginning of the document.

Choose Insert, Index and Tables, and Table of Contents tab. Choose the format from the Formats list and click OK to finish. That's all there is to it! If you see a field code similar to {TOC \o "1-3"} and not the table itself, view the table by pressing [Alt] + [F9].

Your Table of Contents can be used to navigate your document in place of the Document Map. Each page number in the table is a hyperlink to the heading in the document. So, click on any page number and you'll be taken to the relevant part of your document.

Captioning figures

When you add images to a document you should number each of them and add a description of what is in the image. Select the image and choose Insert, Caption. Type the description of the image in the dialog and click OK. If you subsequently add another image before this one in your document, all the numbering will be altered appropriately.

To reference a caption in a document, you'll need to turn the caption from a text box into a frame. To do this, select the text box containing the caption and choose Format, Text Box, Text Box, Convert to Frame and click OK.

create the reference in the text by choosing Insert then Cross-reference. From the Reference type, choose Figure, from the Insert reference to drop-down list choose the type of reference you want and, from the displayed list, choose the figure to refer to. You'll now have a reference in your document linked to the figure itself. PCP


Helen Bradley
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Wonderful watermarks

Put a pattern on the background of your documents and give them a little extra bit of style

→ A great use for the Header and Footer area is to add a Watermark to your document. Create one by choosing View, Header and Footer and add a graphic for your watermark by selecting Insert, Picture, Clip Art. Make the image large and position it in the middle of the page.

→ Select the image and choose Format, Picture, select the Picture tab and, from the Image control: Color drop-down list select Watermark, select the Wrapping tab, click Behind Text (in Word 97 choose None) and click OK. This washes out the image so you'll see the text over the top of it and also ensures that text will flow over the top of the image. Select Close to return to your document – the watermark will appear lighter here than on the printed document.

→ You can also use a Word Art object as a watermark and mark each page in your document as being Confidential or Draft.

To do this choose Insert, Picture, Word Art to add a Word Art image to your header. Choose Format, Word Art, Colors and Lines tab and use the Fill Color and Line Color drop-down palettes to select light colours for your watermark text.

PCPlus
NEXT MONTH
We reveal the outlining features in Word, Excel and PowerPoint

FRONTDESK

➔ Latest headlines posted daily at www.pcplus.co.uk

THE EYES HAVE IT

➔ Fury greets Net snooping law which threatens privacy online

The anger that's been bubbling away online, concerning the Government's plans to intercept UK Internet traffic has finally exploded into public view, with publication of the long talked-about Regulation of Investigatory Powers (RIP) Bill.

Anger has been widespread amongst individuals and companies, uncomfortable with civil liberties issues and matters of commercial confidentiality. Every UK Internet user and service provider is potentially affected.

Listening in

The British Chambers of Commerce (BCC) has put the cost of RIP to the UK at £46 billion. And it has asked for some serious amendments to be made to the bill. In a letter to the Home Secretary, the director general of the BCC said he believed RIP listening devices installed at ISPs could lead to a breach of confidentiality when it came to commercially-sensitive information.

The BCC is also concerned that only one warrant is required to force an ISP to tap e-mail and for encryption keys to be handed over. It suggests this should require two separate warrants. The cut-throat ISP market is also concerned about the possible costs of implementing RIP. As noted elsewhere, ISPs providing unmetered connections are already struggling to provide an acceptable level of service.

Many companies find it hard to trust the Government. Many of its services (especially IT) have been contracted out. Companies may not want to risk their data getting into the hands of rivals.

The Home Office has been shaken by the intense criticism of the RIP Bill. At the time of writing it, had just launched some Web pages at the Home Office site in the following directory: /oicd/ripbill.htm.

www.homeoffice.gov.uk

These included a curious set of PDF files that were supposed to debunk some of the claims being made by many of the bill's critics.

Although some of the claims are

Oliver Heald MP

"The Government has rushed into this Bill without sorting out the details. They didn't listen to the industry when they said that there was no one technical solution available for intercepting Internet traffic. It continues to be of enormous concern to Internet users and business alike"

certainly exaggerated, reaction suggests the Bill is similarly over the top.

The Bill's critics argue a balance has to be struck between creating an environment that is safe for e-commerce transactions and one where online users fear the Government has been given a snooper's charter.

Rights and wrongs

Speaking to **PC Plus**, Oliver Heald MP – Front Bench Home Affairs Spokesman for the opposition – said: "The Conservatives, and just about everybody else, support the need for a Bill to give crime fighters the powers they need to meet the challenges posed by ever more sophisticated criminals.

"What we cannot support, however, is the way the Government has rushed into this Bill without sorting out the technical details. They didn't listen to the industry when they said that there was no one technical solution available for intercepting Internet traffic, they have not been able to give detailed costings, and have had to give way and agree that it will make an adequate financial contribution to companies.

"The offence created in the Bill has been described as 'repugnant to justice', among other things, and it continues to be of enormous concern to Internet users and business alike."

Issues of balance

Some form of Internet regulation is clearly required – but not the sort which drives e-commerce companies overseas. Our future business and leisure lives will be inextricably linked to the Internet.

It's therefore important that the legislation is fair and workable – even if that means substantially delaying the bill. Failing that, a $10,000 setup fee and $1,500 a month will allow you to run your Web services in the unregulated environment of Sealand – a platform a few miles off the Suffolk coast. PCP

HOW THE NEW BILL AFFECTS YOU

Paranoid? You will be

➔ ISPs will have to install black box monitoring devices.

➔ Users get two years in prison for failing to hand over their encryption keys when asked. Even if you don't have the keys, the user is deemed to be the holder unless they can prove otherwise.

➔ It's five years if the user tells anyone they've been asked for the keys. But the gagging order provides no employment protection.

➔ The Government will be able to hold data and encryption keys for as long as it likes.

SOFTWARE NEWS

COREL BACK FROM BRINK

Following its failure to merge with Inprise, Corel (www.corel.com) has been saved by a deal to sell equity to Canada's largest independent investment company. Corel had suggested that it would run out of funding if its merger with Inprise failed to work out. Now, Canaccord Capital will purchase Corel equity, while adding its own additional financing. But Corel is continuing to have to cut its costs. The latest measure is a reduction in staff by more than a fifth and news that chief executive Michael Cowpland will not be drawing a salary this year.

MICROSOFT'S OFFICE BACKOUT

With the launch of its 2000 range of system tools such as SQL Server 2000, Microsoft is expected to move away from the BackOffice branding introduced with Windows NT. The new products will be marketed under the 'Microsoft Servers' name and Microsoft says the change is to prevent confusion with the Office desktop brand. But confusingly, the company is still expected to offer a 'BackOffice 2000 Server' suite.

STAFF AXED AT JUNGLE.COM

With Software Warehouse being merged into Jungle.com, up to 50 staff have been made redundant. The layoffs have come about as a result of duplication and the need for Jungle.com to become profitable as quickly as possible, says a Jungle spokesperson. It's planned for the service to eventually be floated on the stock market, although the volatile nature of technology stocks has meant this will not happen in the short term (www.jungle.com).

MICROSOFT USERS WARN: PRICES WILL RISE

➔ PC Plus readers brand split 'disaster'

The US authorities are now determined to split Microsoft into two companies, but in a poll, 54% of **PC Plus** readers who voted, called the US Government's plans a 'disaster' or 'not ideal' while 33% called the plan 'great news', with a further 9% reacting positively. Judge Thomas Penfield Jackson has himself described Microsoft as 'untrustworthy'. But the company claims the break-up request is 'extreme and unjustified'. Microsoft has also criticised the timetable for the split – just four months.

Microsoft believes a break-up could harm its ability to innovate. And users are now wondering what the reality might be of dealing with two Microsofts.

The business and consumer markets have largely standardised around Windows – where hardware and software add-ons are more or less guaranteed to work. Dealing with separate vendors for operating system and applications will inevitably cause problems – and higher costs. In its paper headed 'Right Verdict, Wrong Remedy', the Boston-based IT consultancy the www.aberdeen.com Aberdeen Group has put a high price on the split.

The report at its Web site www.aberdeen.com/msbreakup.pdf says splitting Microsoft could cost $43 billion.

It believes the 'remedy' will raise costs for the user – not the intention of anti-trust actions – which has been a key Microsoft contention all along.

Instead, it believes the full range of Windows APIs should be opened up to all developers. It also wants to see an independent panel policing Microsoft's activities for five years.

What happens next largely depends on how Judge Jackson's ruling stands up under the appeals process. Microsoft believes the ruling is fatally flawed. And it also hopes a change of US administration in January will come to its rescue.

➔ The full results of our survey, posted at www.pcplus.co.uk, were are follows: 33% – 'Great news', 9% 'Positive', 4% 'Indifferent', 11% 'Not ideal', 43% 'A disaster'. 4,433 votes were cast.

GOODBYE WINDOWS, HELLO NET SAYS GATES

➔ Microsoft describes its post-Windows strategy as 'make-or-break'

Microsoft has announced what it's described as its 'bet the company' initiative, .NET. The ambitious plans, greeted warmly by ex-competitors like Netscape's Marc Andreesson are a conspicuous shift away from the PC and a wholehearted embracing of the Internet and a new "software rental' strategy. Bill Gates demonstrated a computer platform which fuses together a new generation of Web sites with thousands of applications giving businesses and consumers a new level of Web based services over a customisable user interface.

↑ Their .NET, not our .net…

Bill Gates stated, "It encompasses the idea of putting rich code onto [a wide array of] clients. It encompasses the idea of having services across the Internet that help every one of these clients. And then there's a new generation of servers that can work together providing those services that can either run inside of corporations, can run inside an ASP or can be run by the software creators themselves in order to allow all the users to get at that service capability."

"This is just the thing the U.S government is trying to prevent," said Greg Michetti, president of Calgary-based Michetti Information Solutions Inc., a developer for Microsoft. "You end up hooked in Microsoft's world again." This one will run and run.

AOL CONTINUES TO BLOCK RIVAL MESSAGING SERVICES

➔ But the anti-monopoly types are starting to notice

← **Even small services have felt the wrath of AOL.**

Microsoft is not the only company in trouble with the US authorities. For some time now, AOL has been criticised over its stance on instant messaging. This is seen as one of the key battlegrounds on the Internet and AOL owns both the AOL Instant Messenger (AIM) and the ICQ service. But it has continually worked to prevent other companies from accessing users on these services. Microsoft tried and failed, as did Yahoo!, Prodigy and AT&T.

The most recent service to be blocked by AOL is Odigo.com. This small company based in the US and Israel has changed its software numerous times, to get over blocks put in place by AOL. The blocks came without warning and the company has had to offer users patches from its Web site. At the time of writing, the company's site at **www.odigo.com** was showing a patch dated that day. This was accompanied by the statement: "As long as you, our users, want connectivity with other online communities, we at Odigo are dedicated to bringing you closer together." But this sort of situation may soon be a thing of the past. The US Federal Trade Commission (FTC) has requested information about the instant messaging market. This is in association with its enquiries into AOL's proposed $113 billion purchase of Time Warner. The US authorities have suddenly woken up to what the deal may mean. AOL is effectively running a monopoly when it comes to instant messaging. It has around 90 per cent of market – amounting to around a billion messages each day. The FTC is also looking into what the new organisation could mean for broadband Internet and digital music. The review is likely to take several months, but AOL hopes to win approval for the deal by October. However, the European Commission has just ordered a fourth month investigation into competitive aspects of the deal.

MAXTOR SHIPS 100MB/SEC HARD DRIVES

➔ But this is only achievable on ATA/100 standard PCs

Maxtor is now shipping its Ultra ATA/100 DiamondMax IDE hard disk drives. These can support data transfer rates of 100MB/sec in PCs that support the new Ultra ATA/100 standard. Although the standard has not yet been submitted for ratification to the American National Standards Institute, it is gaining support from key PC vendors such as Gateway, Dell, Compaq and Hewlett-Packard. The new Maxtor range comprises the DiamondMax 60, DiamondMax Plus 40 and DiamondMax VL 30. The company says these are the first hard disks to run at 5,400 and 7,200 RPM that support this rate of transfer.

↑ **The new drives are backwards compatible with older systems.**

The drives employ a reliability feature called Maxtor Adaptive ATA Control. This senses environmental conditions as they change and can alter the ATA timing to improve the reliability of the interface. Maxtor believes the new drives now challenge SCSI for performance and reliability. And it's going to incorporate them into its range of storage appliances. The DiamondMax range is backwards compatible with all existing systems that support IDE and ATA. They will automatically configure themselves to transfer data at the maximum possible rate. Maxtor can be found at **www.maxtor.com**.

HARDWARE NEWS

GATEWAY AND AOL GET NETTED

Gateway and AOL are getting together to launch a series of PDA and Internet appliances. These will be based on Transmeta Crusoe chips and a mobile version of Linux. Transmeta launched its chips at the beginning of the year and Gateway and AOL are part owners through a consortium. Sony, Compaq and Samsung are also investors in the project. The chips were chosen for their small size, operating temperatures and extended battery life. AOL will be providing a customised version of its online service for this project. This will be combined with Netscape's Gecko Internet browser technology and the first appliances are expected to ship later this year.

PHONE DEAL

Microsoft and Samsung have signed a deal to develop a new range of mobile phones running Microsoft's software. Samsung will be designing the handsets for the GSM (global system for mobile communications) and CDMA (code division multiple access) networks. Samsung's feature phones will be powered by Microsoft's Mobile Explorer and will be available towards the end of the year.

MESH GOES DOT COM

Mesh has re-launched its Web site at www.meshcomputers.com. Previously, the company ran its services from the less memorable www.meshplc.co.uk. This was because the Bristol-based band Mesh had been using www.mesh.co.uk. Although used to dealing with enquiries about the band's strong vocal and instrumental style, the band's Webmaster has also got used to the occasional PC enquiry. But with its large following, the band wanted to use www.mesh.com but the Capital District Preservation Task Force had beaten them to it!

↑ **Over-clocking is still popular, even with today's fast chips.**

NEW AMD CHIPS AN OVERCLOCKING DELIGHT

AMD is expected to win an increasing amount of business from Intel, as the chip giant's supply problems continue. Intel's fastest processors seem to be causing it the most trouble and AMD is trying to capitalise, especially with its 1GHz Athlon.

In response to Intel's problems, AMD has released its new range of Athlons that employ copper circuitry.

Copper is more efficient at conducting electricity and so less heat is produced, meaning components can be run at higher clock speeds without burning out. Previously known as Thunderbird, the range was launched at AMD's new plant in Germany. Available in six speeds up to 1GHz, the chips have on-die cache running at full speed. A lower spec range known as the 'Duron' was expected to be launched a few weeks later.

But AMD had hardly got its new chips out of the door when the over-clockers struck. k7oc.com has reported how it's been able to over-clock a 700MHz Thunderbird chip to 850MHz.

It was originally thought that the new chips would be significantly harder to over-clock than previous AMD offerings. But it looks as though there's more scope than ever.

VIRUS ATTACKS? IT'S ALL YOUR FAULT, SAYS FBI

Three US institutions have defined a list of the top ten threats to Internet security, and how to deal with them. The FBI, Department of Justice and think tank the System Administration, Network and Security Institute have been working on the problem.

Most successful attacks have been blamed on vulnerabilities in software. The organisations also produced a list of the top five errors committed by computer users.

Not surprisingly, top of list is opening unexpected e-mail attachments. But it's not clear whether we should be taking any lectures from the FBI. A check of its Web site on 16 June revealed that it was down after being hacked on 15 April.

SHAKY START FOR UNMETERED INTERNET SERVICES

Unmetered Internet access is underway in the UK – even if satisfied users are hard to track down. Users complain about engaged tones, poor customer service and support.

The JAK Group's RedHotAnt service (**www.redhotant.com**) has come in for criticism from users – both on access and support. Attempts by **PC Plus** to contact RedHotAnt were unsuccessful. Derek Dolbear, Area Manager at Kent Trading Standards told **PC Plus** "We have received 33 enquires about the RedHotAnt service. But following a visit by two of my officers, we have concluded that RedHotAnt is a legitimate organisation that is experiencing the same problems as most of its rivals."

Meanwhile, BT's enormous marketing budget has brought its Internet service to its knees. Users have complained about poor access to the service and the non availability of e-mail. Neil Short, an angry BT Internet user told **PC Plus**, "BT shouldn't be marketing the service when it can't cope with existing users. I can't even access the service before I go to work at 7:00am. It all went wrong when the unlimited off-peak access started." And NTL has not been able to cope with demand for its 'ntlworld' service. A letter issued to customers said the company was overwhelmed, despite five months of planning. It claims more than a million pounds a day is now being invested in new bandwidth. Finally, LibertySurf had to pull the plug on its new unmetered service following severe congestion and a helpdesk overflowing with complaints.

↑ **The owners of RedHotAnt would do well to read this service.**

It's clear the new breed of unmetered services have had the right intention, even if the reality has largely been a let-down. All the services must make sure they get their houses in order before taking on new users. This might mean borrowing money but it's clear today's users want to be paying for today's bandwidth – not for tomorrow's users to bring the service down.

LINUX NEWS

LINUX MANDRAKE REACHES 7.1

Macmillan USA and MandrakeSoft have announced Linux Mandrake 7.1 Complete, Linux Mandrake 7.1 Deluxe and Linux for Windows 7.1. Improvements include enhanced hardware detection and more applications and utilities. Other changes include better power-saving features on laptops and improved USB support. Full details of the updates can be found at www.linux-mandrake.com.

LINUX CHIEFS JOIN FORCES

Two Linux chiefs who have decided to join forces have commented on the plan to split Microsoft into two companies. Jeffrey Rassas, CEO of EBIZ Enterprises said "I believe this ruling provides great public visibility to the Linux movement." And the CEO of LinuxMall.com – Dave Shaw, said "Windows will now have to stand on its own technical merits." EBIZ has agreed to merge with LinuxMall.com. Once the deal has gone through, the industry will be left with a company a similar size to Red Hat.

SCO JOINS LINUX BANDWAGON

SCO may be almost unheard of in the PC world, but the Santa Cruz Operation is a stalwart of the Unix world. And it is now getting in on the Linux distribution game. Although SCO could have joined the Linux party much earlier, the company had previously regarded Linux as an enthusiast's operating system. Although SCO has a large share of the Unix market, its late arrival to the Linux market means it will have to work hard to catch up. See www.sco.com.

For more Linux news visit our forum at www.pcplus.co.uk/forums/linux

→ **The new Ericsson phones employ the latest technology.**

BLUETOOTH DEVICES ARRIVE AT LAST

→ But will you be buying?

Ericsson has unveiled two new mobile phones – the T36 and the R520. Both models support Bluetooth, the much talked about wireless communications technology which looks set to revolutionise device to device communications with its 'look, ma – no wires' approach. These phones are among the first products to be announced that support Bluetooth, and are expected to appear in retail by the end of this year. They will incorporate wireless headsets, the ability to 'beam' information between handsets and, almost inevitably, the ability to cope with multi-player games.

Not surprisingly, both phones support a range of other new technologies. Both are triple band, making them usable in Europe, Asia/Pacific and America. They come with a built in WAP browser, which allows access to Internet-sourced information, and include the ability to handle secure e-commerce transactions.

The T36 incorporates voice recognition, which allows users to initiate a call by saying the name of the person they want to phone. Voice commands can also be used to navigate the phone's menus, obviating the need to remember complex keystrokes. The R520 supports GPRS (General Packet Radio Services), and so is ready for data transfer at the higher speeds this will allow when it comes on stream by the end of the year.

To complete the picture of wireless information integration, Ericsson has also announced a Bluetooth PC Card. A departure for the mobile phone specialists, this will facilitate wireless connections between Bluetooth enabled phones and portable computers for easy data exchange between the two.

Sandra Vogel

↑ Copycat worms are almost guaranteed.

NEW WORM SPAMS MOBILE PHONES

➔ An unusual headline you'll be seeing again

As technologies converge, so new devices can expect to be hit by viruses. The VBS/Timofonica worm spreads through e-mail from the Outlook address books on infected PCs. The message is in Spanish and arrives with a subject of 'TIMOFONICA' and a VBS file attachment called 'TIMOFONICA.TXT.vbs'. As sending itself to all users in an Outlook address book, the worm will send a message to the correo.movistar.net domain.

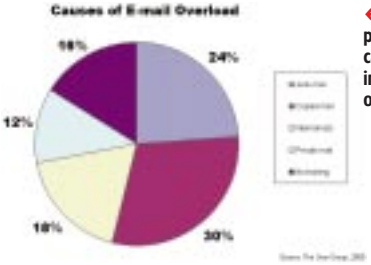
The message will go to a randomly generated number – which should correspond to a mobile phone number. This domain is actually an SMS gateway for text messaging. And the number of SMS messages sent corresponds with the number of users in the Outlook address book. Telefonica is the main Spanish telephone company. Timo is the Spanish word for 'trick' and the message criticises Telefonica's apparent monopoly.

USERS BOGGED DOWN WITH E-MAIL

➔ Three hours a day go on this labour-saving innovation

Office workers returning from holiday often find their inbox packed with hundreds of new messages. Recent research from The User Group shows the average worker wastes three hours each day dealing with irrelevant e-mails. 428 organisations – representing more than two million users – took part in the survey. A survey undertaken two years ago put the figure at 90 minutes.

The User Group believes the total could soon break through the four hour barrier. And it's clear that volumes of e-mail must be impacting on productivity – and therefore the economy. The graph shows the causes of this 'information overload'. Although spam features highly at 24 per cent, it's beaten by copied e-mail at 30 per cent. Internal mailing lists came in at 18 per cent, private messages at 12 per cent and a lack of training at dealing with e-mail at 16 per cent. The study also shows that while e-mail facilities are provided to staff as a matter of course, most companies provide no training in the use of the technology.



← Bad internal practices are the causes of information overload.

INTERNET NEWS

WATERSTONES TO OFFER NET KIOSKS

With books being one of the most popular online purchases, Waterstones is putting Internet kiosks in its stores. By offering a subset of the full Waterstones Internet service, shoppers will be able to check if books are available in-store, in another store or available to order. Waterstones believes this will give it an edge over rivals such as Amazon.

WEB SHOP AT YOUR PETROL STATION

Online ordering may provide more choice and better prices, but deliveries can be a problem – especially if someone needs to sign for it. But it's funny how old solutions can often solve new problems. Several initiatives could see Internet Shoppers collecting their wares from more traditional outlets. Iceland is planning to deliver customer orders for collection at Booker stores. Dropzone1 is planning to make deliveries to Londis and Spar stores as well as Jet petrol stations. The service is starting in Reading and is expected to go nationwide from the autumn. Check out the company's Web site at www.dropzone1.co.uk.

VAT ON WEB DOWNLOADS?

The EC is planning to close a loophole that allows companies outside Europe to sell Web downloads without charging VAT. The EC wants all companies to charge VAT, once European sales have reached 100,000 euros – around £63,000. This means that US companies would have to register for VAT in a European member state. But the proposal is seen as flawed. It's difficult to see how such companies could be forced to register for VAT in a foreign country. In any event, they will not come under EC jurisdiction until they are registered.

AUGUST – SEPTEMBER 2000

UPCOMING EVENTS

➔ Get yourself to this month's computing and I.T. events

Date **10-11 August**
Event **Using the Internet as an effective Competitive Intelligence tool**
Venue **Cyberia Cafe, London**
Contact **www.inconference.co.uk/conf3.htm**

Date **14-18 August**
Event **IT Law Summer School**
Venue **Downing College, Cambridge**
Contact **www.ibc-uk.com/cl1182/?source=tscl1182**

Date **20-24 August**
Event **Computer Training World**
Venue **San Francisco**
Contact **www.influent.com**

Date **30 August-3 September**
Event **CeBIT Home**
Venue **Leipzig, Germany**
Contact **www.cebithome.de**

Date **3-5 September**
Event **European Computer Trade Show**
Venue **Olympia**
Contact **www.ects.com**

Date **12-14 September**
Event **Financial Management Software Solutions**
Venue **Radisson SAS Portman, London**
Contact **www.fmsss.co.uk**

Date 21-24 September
Event **Live – Consumer Electronics Show**
Venue **Earls Court**
Contact **www.live2000.com**

Date **26 September**
Event **Using the Web for Business 2000**
Venue **Sheraton Grand Hotel, Edinburgh**
Contact **www.wfb.uk.com**

Date **26-27 September**
Event **Business Systems Show**
Venue **G-MEX Centre, Manchester**
Contact **07000 464 336**

Readers are advised to pre-register and check with organisers

BEHIND THE NEWS

NET PRIVACY RIPPED TO PIECES?

➔ Is the RIP Bill a case of the Net old guard over-reacting to a much-needed law, or something more sinister? Jason Thomas finds out

The Regulation of Investigatory Powers (RIP), which is expected to receive Royal Assent in October, obligates ISPs to allow the interception of any requested electronic message entering or leaving the UK. If that message is encrypted the sender – whether an individual or business – must provide their private key to decrypt it.

Failure to do so could result in a two-year prison sentence with similar penalties for anyone who tips off the recipients that their encrypted messages have been intercepted.

Those who will be able to demand such access include the police, Special Branch, MI5, MI6, the DTI and the Inland Revenue. It's not clear exactly how the interception will take place yet – nor will it be for some considerable time after the Bill becomes law. The contentious clause 12 allows for consultation periods to discuss and implement the generic nature of ISPs obligations, after which an order will be passed in Parliament, followed by specific instructions from the Home Secretary to each ISP.

A report by the Smith Group for the Home Office has suggested three methods, what it calls active, semi-active and passive – the basic differences being the level of interaction with the ISP's software, the degree to which interception is automated and cost.

Active interception copies all selected e-mail messages, requires tight interaction with the ISP's software and infrastructure and is relatively cheap; while passive interception provides only the IP information about selected subscribers, requires no interaction with the ISP's software and infrastructure.

Black boxes

There has also been some loose talk about mysterious 'black boxes', which the Home Secretary Jack Straw has denied. But what is clear is that interception will take place and the onus is on ISPs to develop and maintain the means and at their own cost.

The British Chamber of Commerce is upset about the proposals because it could result in companies deciding to develop their e-commerce applications outside the UK – at a cost of £46 billion it says in a report. Jack Straw has poured scorn on this figure saying the report is 'riddled with false assumptions'. Nevertheless businesses are lobbying the Trade Secretary Stephen Byers for amendments to the Bill. For his part, he says the Government is open to constructive criticism and will implement amendments if need be.

↑**The Home Secretary Jack Straw doesn't accept the RIP Bill could cost UK businesses £46 billion, but Trade Minister Stephen Byers says the Government will amend the Bill if necessary.**

"We are aware of concern within the business community about some of the proposals in the measure which is why the Home Secretary has indicated that he is more than willing to consult business about their concerns and, if necessary, the measure can be amended," he said.

"It obligates ISPs to allow the interception of any requested electronic message entering or leaving the UK"

However, the Bill has already passed through the Commons and now only has to pass the Lords' committee stage. Fortunately the Lords appear to be as worried about the Bill as UK businesses, and have called for an independent body to monitor the monitoring. Whether this will address the business community's other major worry, that the interception of messages could result in companies facing claims for damages.

But commercial interests aside, the Lords also spotted the other major issue here when Lord Cope said: "The central problem is the indiscriminate nature of the power." **PC Plus** readers with long memories will remember that the measures proposed in the RIP Bill first appeared in the Electronic Communications Bill, which became law in June. They resulted from last year's European Parliament resolution calling for interception at the ISP level. This in turn came from a resolution from the Lawful Interception of Communications council – otherwise known as Enfopol.

And looking even further back the Enfopol documents were inspired by a series of secret meetings between various international law enforcement agencies. They were called the International Law Enforcement Telecommunications Seminars (ILETS) and met without parliamentary knowledge or government supervision. The US Federal Bureau of Investigations was the initiating body, and the measures ELTIS agreed became the basis of the Enfopol documents, which ultimately have dictated UK Government policy. So it seems a group of unaccountable individuals from various security services have dictated European and UK policy.

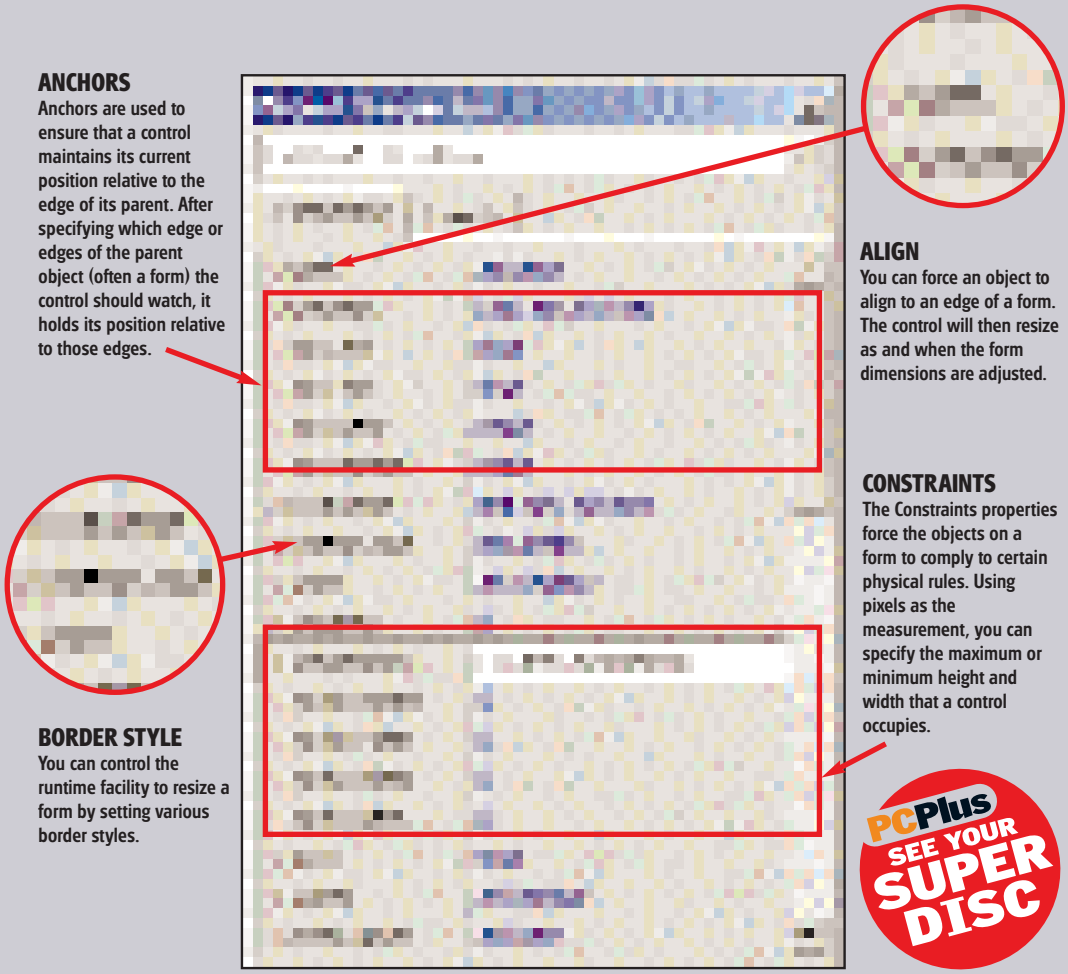
The Netherlands has already enacted legislation which achieves what the RIP Bill is trying to – in comes into force in August. Dutch ISPs have already installed their 'black boxes' which allow them to intercept all Internet traffic – but not, significantly, direct end-to-end messages as might be sent between, say, terrorists or drug traffickers communicating via their own modems.

But the cure could be worse than the disease. Individual privacy goes out the window, as does commercial confidentiality (accusations still fly that two French firms Thomson and Airbus lost contracts because of information gleaned from the already existing – but not officially admitted – Echelon global monitoring system and passed to their competitors); and it doesn't stop criminals passing messages to each other directly and secretly (because direct modem-to-modem communication isn't covered).

There is no doubt the RIP Bill will become law and that your messages could be intercepted – the only doubt is how this interception will take place. PCP

Using the object inspector

C++ Builder 4 makes flexible form sites easy



PCPlus SEE YOUR SUPER DISC

Keeping objects in place

Once your code is in place and your program's up and running, **Dave Jewell** reveals some jobs you could have overlooked...

PCPlus SUPER DISC PATH: \prog\files\cppwkshp

RAD-based development systems such as C++ Builder and Delphi make it easy to create a professional looking Windows application. In some ways, they make it too easy; once you've got your program running and debugged, it's easy to think the job's done, but many novice developers often neglect to consider other important issues. For example, what happens when the user resizes your application window or dialog? We've seen many Windows applications, written in a variety of programming languages, which completely overlook the possibility that this might happen.

As an example, take a look at the picture below right. This shows a set-up dialog belonging to a commercial application. We'll spare their blushes by not revealing the name of the program, but it's actually part of a computerised Bible. As you can see, the developers have more or less completely overlooked the possibility of the user resizing the dialog, thus leading to the rather unprofessional effect seen here.

Different solutions...

Other than overlooking or ignoring the problem, there are actually three different ways in which you can tackle this resizing issue. By far the easiest solution is to simply prevent the user from resizing a form at all. Unfortunately, if you're using an early version of C++ Builder, then the hard way is the only way.

In practice, you need to add lots of code to the OnResize event of the form itself; a typical code snippet is shown in this month's **Code Corner** – the Resize fragment. Here, you can see that every time the window is resized, the program has to recalculate the width and height of a list-box component, keeping it ten pixels away from the edge of the form. This technique certainly works, but it suffers from a number of disadvantages:

It gets complicated (and therefore error prone) when resizing/repositioning a large number of components. As ever, less code = less bugs.

What this means is that there's no mechanism to automatically prevent the form from getting (for example) less than 200 pixels wide, or 100 pixels high.

The solution

Fortunately, C++ Builder 4 comes to the rescue with another, easy to use, but powerful technique. And, incidentally, if you haven't yet installed C++ Builder 4.0 Pro, then this is a good reason to do so! With a visual component selected, the Object Inspector will display two new properties called Anchors and Constraints. Used singly or together, they make it easy to control the way components move/resize themselves as a form is resized.

Let's look at the Anchors property first. As the name suggests, this property controls the way in which a component 'anchors' itself to the form, determining how it responds to changes in the form size. As you'll see, the Anchors property is made up of four nested, properties: akLeft, akTop, akRight, akBottom. Each of these is a Boolean flag which can be true or false. By default, the akLeft and akTop flags are true which means that the control maintains the same position relative to the left and top edges of its parent form. This corresponds to the

FORUM www.pcplus.co.uk/forums/cpp

expected behaviour of a control – you'd expect it to stay the same distance from the top, left corner of the window.

If you change these settings so that only the akBottom and akRight flags are set true, then the control will remain in the same position relative to the bottom right window corner, and that's obviously useful for window resizing situations. So far so good, but what about the situation we outlined earlier, where you want the width and height of a list-box to change in line with a form resize operation? To do this, you can set all four of the aforementioned Anchor flags to true. Think about this for a moment: the akLeft flag tells the control that it's got to keep a constant distance from the left edge of the window, while the akRight flag says it has to keep a constant distance from the right edge. How can it do satisfy both criteria? Obviously, it has to stretch and the same argument likewise applies to the akTop and akBottom flags. Thus, setting all four flags gives us the same result as the Resize code snippet, but without having to write a single line of code!

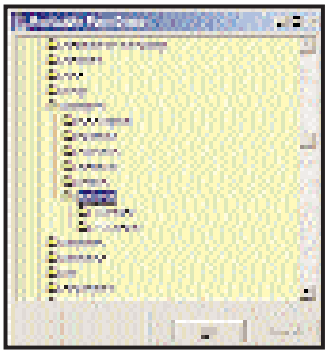
But what about the Constraints property? This enables you to set maximum and minimum values for the width and height of a control. Thus, you might specify that a list-box can't be reduced to less than 50 pixels in width, and the list-box won't allow itself to be 'squeezed' beyond this point. You'll notice that the form itself also has a Constraints property, and this can be used to easily prevent your application window from being sized greater or less than you wish.

Putting it all together

We can put these ideas together into a simple demo program, which you can see running in picture above. This program doesn't actually do anything useful, but it does illustrate how to use the Anchors and Constraints properties in such a way as to greatly reduce the amount of 'geometry management' code that would otherwise be involved.

As you can see, the program uses a TCDirectoryOutline component (if you're not familiar with the component, you can find it on the Samples page of the component palette) to display a list of directories on the current disk drive. You might, for example, use this component as the basis for a 'directory chooser' dialog box. In this particular case, there's also a horizontal TBevel control which stretches across the width of the form and makes a neat separator between the directory outline and the OK and Cancel buttons below.

If you carefully study this month's project (as ever, it's on the **SuperDisc**), you'll find very little code! The important stuff is in the property assignments. The OK and Cancel buttons both use their Anchors property to ensure that they remain at a fixed distance from the bottom, right, corner of the dialog box. In a similar way, the Anchors property of bevel control have been set up so that the control is anchored to the left, bottom and right edges of the form.



↑Here's the demo in action. This application doesn't do anything very spectacular, but it does illustrate how you can prevent the OK and Cancel buttons from being hidden using just a couple of lines of code.

Code Corner

RESIZE

```
void __fastcall TForm1::FormResize(TObject *Sender)
{
  ListBox1->Width = ClientWidth - ListBox1->Left - 10;
  ListBox1->Height = ClientHeight - ListBox1->Top - 10;
}
```

FORMCREATE

```
void __fastcall TForm1::FormCreate(TObject *Sender)
{
  Constraints->MinWidth = ClientWidth - OKBtn->Left + 10;
  Constraints->MinHeight = ClientHeight - Bevel1->Top + 25;
}
```

This means that the bevel will automatically resize itself, stretching and contracting as the form width changes. Finally, the directory outline control has all four anchor flags set to true, meaning that it maintains a fixed distance from all four edges of the form.

Even so, as it stands, there's nothing to prevent the user from making the form ridiculously small, shrinking all the controls out of existence. For the purposes of this demo, we've decided that it should be impossible to hide the OK and Cancel buttons. This is easily accomplished by the FormCreate code snippet in **Code Corner**; it's invoked when the form is first created. It sets the MinWidth property of the form, so that the form can't be resized smaller than the combined width of the OK and Cancel buttons, plus a bit of spacing on either side. Similarly, the MinHeight property is initialised, so that there's always sufficient height to display the OK and Cancel buttons.

You might be wondering why bother with a FormCreate handler? After all, you could simply figure out the required values of MinHeight and MinWidth (based on the code we've supplied), plugging those values into the form properties at design time. That would certainly work, but if you ever changed the width/height of the form, or moved the OK and Cancel buttons, you'd then have to perform those calculations over again. This way, it's all done for you. As Einstein said, things should be as simple as possible – but no simpler! PCP

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PCPlus

NEXT MONTH

Dave tackles the Windows registry and file associations

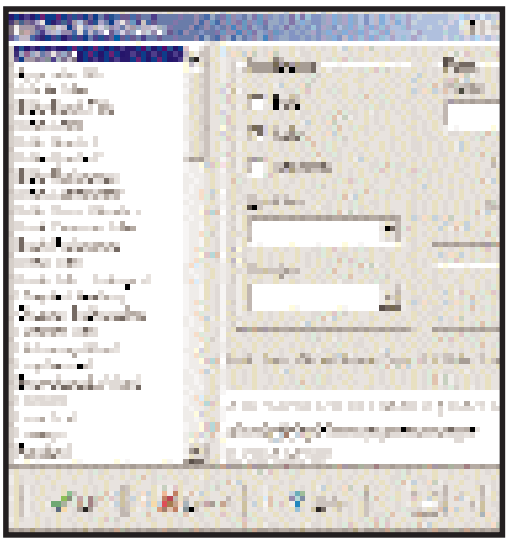
→Different ways to place objects

Make your objects behave properly

→C++ Builder provides a rich programming model, and therefore it shouldn't be too surprising that it offers a wide variety of ways to position objects on a form. In addition to the Anchors and Constraints properties that we've discussed this month, there's also the familiar Align property which can be used to force a control to fill the entire client area (alClient) or else 'hug' a specific edge of the parent control.

Version 4.0 of the development system also provides a couple of extra strings for your form resizing bow in the shape of OnCanResize and OnConstrainedResize. The OnCanResize routine is similar to the old OnResize routine except that it happens before the resize operation takes place and it also includes a mechanism such that the application can prevent the resize from taking place if the proposed new form size isn't valid.

Just to make things a little more interesting, there's also OnConstrainedResize. This event is fired after OnCanResize but before OnResize. As parameters, this event handler receives the four Constraints property values which can be fine tuned by the event handler in special



↑ Here's an example of how not to do it. Many programs (even expensive commercial applications) allow you to resize a window in such a way that important parts of the user interface are either obscured or squeezed out of existence.

Fading and wiping images

PCPlus SEE YOUR SUPER DISC

David Griffiths becomes the curator of his very own Java gallery

Someone I know once had a job at a film production company writing software for the machine that faded scenes together. The machine was a bit like a projector.

Different bits of used film would be projected on to a piece of new, unexposed film.

By putting the new film through the machine again and again, and controlling the amount of light passed through on each frame, it was possible to simply build up composite wipes, fades and so on.

These effects can look spectacular applied to some decent images and the good news is that it's possible to create a similar set of effects within Java as well.

PCPlus SUPER DISC **PATH: \prog\files\java**

The Gallery applet, which we create opposite (and which is on our **SuperDisc**) does a similar job to the old projection machine. It displays a series of images, each one fading into the next.

Give it a go and you'll see what we mean. PCP

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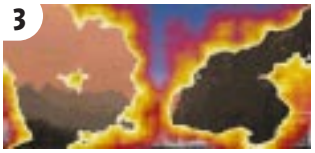
1

2

3



↑Three types of mixes. A simple fade, a top-down wipe and the 'burn' effect.

Basic structure

There are two ways of displaying a sequence of images. We can either load them all up to begin with, or load them as we need them

Pre-loading all the images is a good idea if we only have a few of them, because we will never need to load any image twice. Problems arise once we have more than a handful of images. First, the applet will take a long time to start and second, it is likely to run out of memory.

So we've chosen to only store the images in memory that we need. This means we will keep three image references:

- The current image
- The image that we are fading to
- The next-but-one image that we can download in the background while the other two are fading

In pseudo-code we can write out the program structure as:

```
Load image0
Load image1
Set n = 0
While true
Start downloading image n+2
Start fading n->n+1
Wait for fade and for image n+2
Increase n->n+1
Loop
```

We'll look at the details of the animation in a moment, but, first, how do we download the n+2 image in the background?

Background image loading

Most beginners' books on Java actually use background image loading, without drawing attention to the fact. You might load an image in the init() method with:

```
myPiccy = getImage(getDocumentBase(), "fred.gif");
```

And then display it in the paint(…) method with:

```
g.drawImage(myPiccy, 0, 0, this);
```

This seems straightforward, but, in fact, although we appeared to be loading the image with a call to getImage(), all we were actually doing was informing Java where the image was stored.

It won't actually start loading the image until it needs to, such as when it is drawn on the screen in the drawImage(…) method.

We can make sure that an image is fully loaded by using a MediaTracker object. This works like a network nanny, continually checking to see if the image has been completely transferred over the network. Here's a piece of typical MediaTracker code:

```
mediaTracker.addImage(image, 0);
mediaTracker.waitForID(0);
```

This means, 'I'm going to give the image the number 0, and then wait for it load completely from the network'.

This is great if we can afford to wait, but if we need to be doing something else, like updating an animation, this code won't do.

One way to fix the problem is with an imageUpdate() method. If you create a method in your applet looking something like:

```
public boolean imageUpdate(Image img,int flags,…)
```

it will be called every time another chunk of an image is delivered to the applet. When the whole thing is finally loaded the imageUpdate method will be called with the ALLBITS flag set. When this happens we can look to see if the animation is complete, and if so we can move along to the next picture in the gallery and start the animation again.

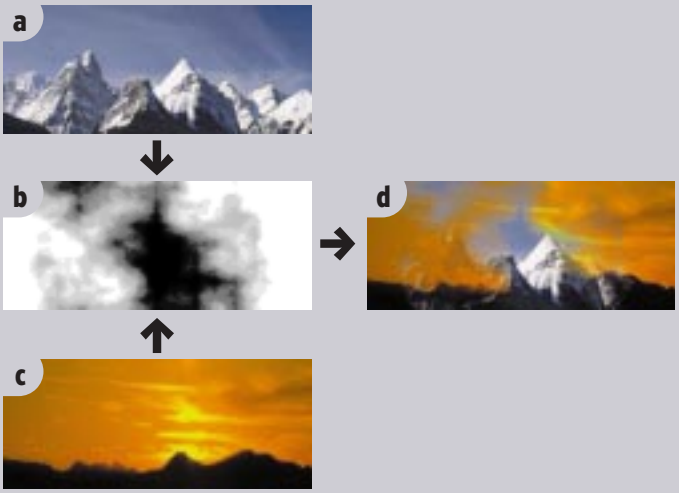
You can see the imageUpdate() method in the Gallery.java code on the **SuperDisc**.

The animation

Although many graphical effects can be created with fairly simple techniques such as copying rectangular sections of an image around (see previous **Java Workshops**) for something more complex like fading images, we need to work on a pixel-by-pixel basis.

Like everything else in computers, images can be broken down into a sequence of numbers. In Java this is done using an object called a PixelGrabber, which converts an Image into an array of integers.

Each integer contains information about a pixel in 32-bit full-colour format:



↑ **Also stored separately as a.bmp, b.bmp, c.bmp and d.bmp: Using a mixel array to create a mix of two images. We combine the start image (a) with the end image (c) using the mixel values in array (b). The lower the mixel value – shown here as darker pixels in (b) – the closer the pixel value in the final image (d) will be to the start image.**

Bits	31-25	24-17	16-8	7-0
Value	Alpha	Red	Green	Blue

The alpha value is a measure of the transparency of the pixel. This is usually set to 255 for opaque pixels.

In order to fade between two images, we need to create an average of the pixel colours in a third array which we can pass to the createImage(…) method (see the getNextFrame(…) method in ImageMixer) to create our faded or half-toned image.

Okay, so how do we average two pixels to create a half-toned pixel? We begin by breaking each pixel's 32-bit value into its red, green and blue components:

```
r = (pixel & 0xFF0000) >> 16;
g = (pixel & 0xFF00) >> 8;
b = (pixel & 0xFF);
```

Consider two red values, r1 and r2. We can create a red value that is exactly half way between the two with:

```
r3 = (r1 + r2) / 2
```

But we need to be a little subtler than this. At the start of a fade the pixel will be much closer to the start value (r1) than the end value (r2). We need a weighted average:

```
r3 = (r1 + ((r2 – r1) * p))
```

Where p is some value between 0 and 1. When p is close to 0, r3 will be close to r1, and when it is close to 1, r3 will be close to r2.

If we want to perform this calculation in a number of discrete frames this becomes:

```
r3 = (r1 + ((r2 – r1) * fn / TOTAL))
```

Where fn is the current frame number, and TOTAL is the total number of frames. Now for each frame the sequence of events is:

- Convert the start and end images into integer arrays
- Break the integers into red, green and blue values
- Average the values according to the frame number
- Create a new image with the averaged values
- Display the image

The ImageMixer class, which creates a very simple fade, does this.

More complex mixing

Suppose that instead of wanting the whole image to fade at the same rate, we wanted some pixels to fade earlier than others.

In a wipe effect (see picture d) the new image fades in from the top downwards.

We can create more complex effects like this by storing an extra value for each pixel, called a mixel. A mixel defines how soon a pixel will fade or mix to another pixel.

Imagine our red pixels r1 and r2 had a mixel value of 150. We can create a complex fade with:

```
if (mixel < frameNo – 20)
  r3 = r2;
else if (mixel < frameNo + 20)
  r3 = [weighted average];
else
  r3 = r1;
```

In frames 0-129, this code will set r3 to the start colour, r1. In frames 130-149 the value of r3 will fade from r1 to r2, and it will stay at r2 from frame 150 to the end of the animation.

You can find the actual Java code for this in the burnFrame(), fadeFrame() and sharpFrame() methods of the MixMap class.

In order to create the top-down wipe effect we need to set up an array of mixels with very low values in the top few rows, which gradually increase as we progress to the bottom of the image.

Once we have this Mixel structure in place, it is easy to create brand new mixes. In the **SuperDisc** examples you will find several including Wipe (the simple wipe), Butterfly (a kind of folding X) and Smoke (a fractal Mixel array, that looks similar to a contour map).

In order to create your own effects, you will need to copy and modify one of these classes. Wipe is probably the easiest. Try creating a mixel array shaped like a pyramid – with large values in the centre and small ones around the edges. This would create a shrinking rectangular fade.

Edge effects

So far we have only created fade effects. That is, we have calculated red, green and blue values that lie somewhere between the red, green and blue values of the start and end pixels. We can also colourise the pixels, so instead of seeing a soft edge between the start and end images, we can create a coloured band.

In the Workshop files there is an example of this in the burnFrame() method of the MixMap class. As soon as a mixel becomes active, it sets the faded pixel to white, which turns to yellow and then finally to red.

As it does this, it starts to merge in the value of the destination colour, so the redder it gets, the more transparent it becomes.

The Burn class uses this to create a flame effect that seems to burn one image and leave the new one behind.

Although it sounds very complicated, it's actually very easy to use.

The Burn class is almost exactly the same as the Smoke class, with the major difference being that Burn calls:

```
setEdgeType(FIRE);
```

in its constructor. By default the edge type is FADE. You can also set it to SHARP for a simple transition from the old image to the new image.

Try running the applet with just a Burn mixer, and then with a Smoke mixer. You will see they are different.

To see how it works, try inserting the setEdgeType(FIRE) line into the constructors of the Wipe and Butterfly classes. Let me know if you create your own mix effect, and I'll include the best in a future **SuperDisc**.

FORUM **www.pcplus.co.uk/forums/java**

Using the Gallery applet

Save yourself some time – grab the Gallery applet off our SuperDisc

The Gallery applet is compiled on the **SuperDisc** into a single jar file called gallery.jar. Place this in the same directory as your Web page, and then place an ‹APPLET..› tag into the HTML of your page, for example:

```
<applet code="Gallery"
archive="gallery.jar"
width=300 height=200>
```

The height and width values should match the size of your images (Gallery expects all the images it displays to be exactly the same size as the applet).

If you want the applet to display three images called tom.gif, dick.jpg and harry.jpg you need to enter these lines:

```
<param name="image0"
value="tom.gif">
<param name="image1"
value="dick.jpg">
<param name="image2"
value="harry.jpg">
```

Next you need to choose which of the mix effects (Burn, Butterfly, ImageMixer, Smoke and Wipe) you want to use. By default the applet will use all of them. If you just wanted to use Smoke and Wipe, say, you need to list them in the mixers parameter, separated by commas, that is:

```
<param name="mixers"
value="Smoke, Wipe">
```

You need to close the applet tag:

```
</applet>
```

There are several other parameters you can use with Gallery. See the source code for details.

Discovering XML: PART THREE

How to script an XSL template

PCPlus SEE YOUR SUPER DISC

Dermot Hogan shows us how to transform XML in to HTML text

Last month we looked at XSL and examined how the language used search patterns to locate an XML fragment or sub-tree in the main XML tree and used a Visual Basic program to extract the XML sub-tree and display it. This month we look at transforming the XML tree into HTML text. But as XSL is often used in HTML operations, it makes sense to examine another way of using Visual Basic – scripting.

Scripting means lightweight embedded code used within another program environment to extend the original program's functionality. A good example is JavaScript expanding the capabilities of Netscape Navigator. The Java in JavaScript has nothing whatsoever to do with the Java language, by the way: JavaScript was originally called LiveScript by Netscape. Some bright spark then thought he saw a marketing opportunity and tried to jump on the real Java bandwagon, and renamed LiveScript to JavaScript to the confusion of many thereafter.

Microsoft has its own version of JavaScript, Jscript, but also supports another scripting language that's more familiar to Visual Basic users, VBScript. As to which one to use, you pays your money and takes your choice. Or not, since they're all free. JavaScript, Jscript and VBScript also do more or less the same thing. But since Microsoft doesn't (yet) control the browser market, you won't find many examples of VBScript embedded in HTML pages. However, for programming Microsoft technologies, COM in particular, VBScript is a slightly better bet than the alternatives. PCP

PCPlus SUPER DISC **PATH:** \prog\files\vbwkshp

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PCPlus

NEXT MONTH

We look at some more XSL constructs and finish off by constructing a database application using HTML, VBScript and XSL

Starting VBScript

Where and how to host VBScript

VBScript must be hosted in another environment to run. There are two convenient ones – Internet Explorer 5 (IE5) and the Scripting Host. We won't look at the Scripting Host here, since all it does is run VBScript code. We're more interested in seeing the output from our script, so IE5 is the best option. Within an HTML page, you specify a script by enclosing it in the tags ‹SCRIPT› ... ‹/SCRIPT›

```
<SCRIPT language="VBScript">
function hw()
  hw = "hello, world"
end function
</SCRIPT>
```

The language parameter selects between various scripting languages such as JavaScript or Jscript, but below that the function text is pure Visual Basic. Note that the function doesn't have an AS return type. That's because in VBScript, you can only return a variant, so it isn't needed. Similarly, you don't need to DIM something AS a type – you just use the DIM keyword:

```
Dim x, y, z
```

You can call the function by using some more script, embedded in HTML:

```
<P>script start</P>
<P style ="color:red">
  <SCRIPT language="VBScript">
  document.write(hw())
  </SCRIPT>
</P>
<P>script end</P>
```

We've used a small bit of Dynamic HTML, document.write, to get the output of the function, hw, to the screen. DHTML is a fairly big topic in its own right and we won't do more than touch on it here. The whole HTML page is on the **SuperDisc** in the file test1.htm. If you look at this, you'll see that the hw function is defined in SCRIPT tags in the header section of the HTML, while the code that calls hw is in the HTML body. There's no very good reason for this – it's largely convention.

Now that we've seen how to include some Visual Basic code, we need to include the XML that we've been looking at. This can easily be done using a data island. A data island is just a chunk of XML text embedded in HTML inside the tags ‹XML› ... ‹/XSL›:

```
<XML id="xmltext" src="pcplus.xml"></XML>
```

You can either include the text directly between the XML tags or include it using the src directive as we've done here. The XML text is exactly the same as that we used last month. One important point to note here is the DHTML id field. This allows us to reference the XML text directly – we can then set a variable to the text, as follows:

```
set x = xmltext.documentElement
```

We can then perform operations similar to those we were doing last month:

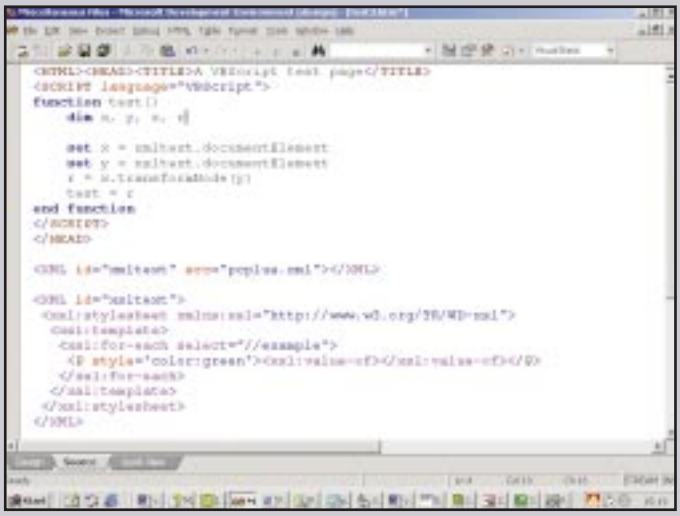
```
function test()
  dim x, y, z, r

  set x = xmltext.documentElement
  set y = x.selectNodes("//example")
  for each z in y
    r = r & "<P style='color:blue'>" & z.text & "</P>"
  next
  test = r
end function
```

Here, the function test returns a string constructed from the example elements (those XML parts included in the ‹EXAMPLE› ... ‹/EXAMPLE› tags) by using an XSL search pattern '//example' as we described last month. The complete file is on the **SuperDisc** in test2.htm.

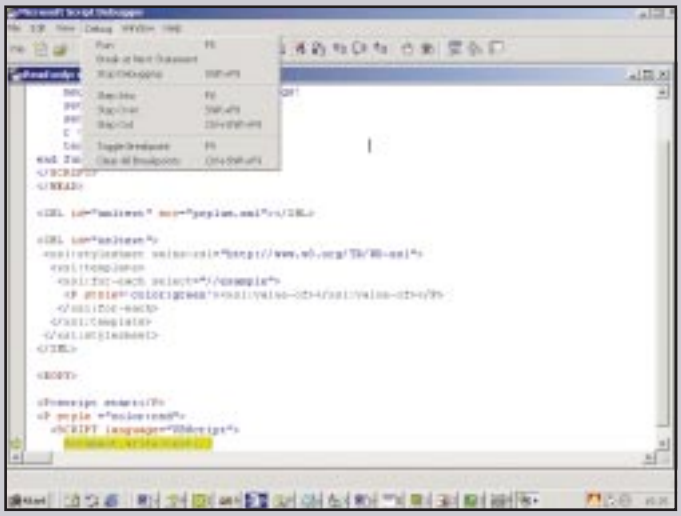
Now we've got to the point that we were at last month, but using Internet Explorer 5, VBScript and XML data islands. You might think that this looks a lot simpler than messing around in an expensive Visual Basic programming environment when you can do the whole job a lot more simply using free software. True, but only up to a point. Just try debugging a long and complicated script like this and you'll appreciate why Visual Basic as a program isn't going to disappear just yet!

XSL itself

Back to XSL now. Similarly to XML, XSL can be included in a HTML file using a data island in exactly the same way as XML (don't forget – XSL is XML):



↑Here's the source code for the final example. We've used Visual Interdev to edit the HTML/XML/XSL and VBScript and to display the result. It's not really necessary – but it's a lot easier than using Notepad!



↑One problem with VBScript is the rather limited debugging facilities available. You can use the Script Debugger, but it's a poor relation of the full thing available in Visual Basic itself.

```
<XML id="xsltext">
  <xsl:stylesheet xmlns:xsl="http://www.w3.org/TR/WD-xsl">
  <xsl:template>
  <xsl:for-each select="//example">
  <P style='color:green'><xsl:value-of /></P>
  </xsl:for-each>
  </xsl:template>
  </xsl:stylesheet>
</XML>
```

Here, the first line tells the XSL parser that it is indeed XSL. The next line introduces an XSL template. XSL works by matching templates against the XML tree. If a template matches, then the XSL code inside the template is activated. The template here has no selection criterion, so it will match anything and will be activated (see below). The next line, ‹xsl:for-each› introduces the basic XSL looping construct and a selection criterion. Many XSL constructs look something like this:

```
<xsl:something select='selection text'>
```

where the something is only activated when the selection text is matched – it's sort of a tree based key-in-a-lock processing. If there is no select specified, then the action will always be activated whatever the text in the XML tree is at that point. In fact, this is why the xsl:template works: it matches the whole tree.

The selection criterion we've chosen, //example, is the same as we've used before. It selects all ‹EXAMPLE› ... ‹/EXAMPLE› sub-trees in the source XML tree. Having matched some XML text, the inner XSL code is executed. This consists of the text

```
<P style='color:green'><xsl:value-of /></P>
```

a combination of HTML and XSL. If the XSL parser finds some valid XML text which isn't an XSL keyword, it just spits it out as output. Here, the ‹P› ... ‹/P› is indeed valid XML text (as well as being perfectly good HTML text) and will be sent to the output. Inside the ‹P› ... ‹/P› is, however, another piece of XSL. ‹xsl:value-of /› simply gets the text of the current XSL context – and note the abbreviated XML form of an empty XML tag pair. Being in a for-each loop, the inner text is run for each ‹EXAMPLE› in the collection.

But how do you tell the XSL parser to do its stuff in the first place? All you need to do is call 'transformNode' which (as its name suggests) transforms one set of XML nodes into another using an XSL template:

```
set x = xmltext.documentElement
set y = xsltext.documentElement
r = x.transformNode(y)
```

Here, we've set x to point to the XML text to be transformed (our **PC Plus** article database from last month) and y to the XSL text (above) that contains the template. The work is done by calling transform Node with the XSL template as the argument and the output – being HTML text – is placed into a variable, r. The complete file is in test3.htm.

Finally, we'll look at how you can perform a simple test in XSL. Don't forget that XSL is primarily a style sheet language – not a full blown programming system, so you can expect things like conditionals to be a bit simplistic (primitive would be a better description). Tests are done in XSL by using the ‹xsl:if› tag:

```
<xsl:if test=".[.='delphi166.exe']">
<P style='color:green'><xsl:value-of></xsl:value-of></P>
</xsl:if>
```

This is in test4.htm. The syntax of the test expression needs a bit of explanation. A more normal way of expressing this might be to say:

```
<xsl:if test="delphi166.exe">
```

But this won't produce the correct results. Instead, you have to select the current element (the position in the XML tree) – that's the first '.' – then, since this is a collection, you need to subscript it – hence the square brackets. Finally, you need to compare each element of the collection with the value you want to select – that's the second '.' and '='. Actually, this isn't a very good way to select the value that we're looking for, since we're in a loop; it's better to select from the tree collection directly. But it's the sort of contortion you have to go through sometimes to get the result you want. Like Unix regular expressions, it can be a bit confusing at first until you get the hang of it.

FORUM **www.pcplus.co.uk/forums/vb**

What's VBScript?

It's slow, it's relatively inflexible, so why use it? It turns out that it has a few handy extras which can give it an edge over Visual Basic...

→VBScript is supposed to be a strict subset of the real thing, Visual Basic.

In practice, it isn't quite like that. VBScript is in many ways a cut-down version of the full blown Visual Basic programming language.

But it's also got some highly useful extensions – run time code evaluation and a decent regular expression search to name just two.

Thee main restrictions in VBScript are, first, it's not compiled so it's slow. If you need speed, it's far better to write the main component in a compiled language, C++ say or Visual Basic, build a COM object then call that from the script rather than write a huge and complicated script program.

Scripts are intended to be lightweight and small – though that's not how things turn out sometimes. The second major difference is that there's only one type of variable in VBScript – a variant.

There are other differences as well, mainly because of the environment. Forms are treated differently from Visual Basic, for example, and input/output isn't done using the standard Visual Basic methods.

And while we're on the subject of differences, it's a good place to point out that these days Visual Basic for Applications (VBA) – the glue that is used to join up Microsoft products – is, essentially, good old Visual Basic itself.

Apart from not being able to compile VBA, the syntax is just the same as that in the full Visual Basic programming environment.

How to 'serialize' Delphi objects

PCPlus SEE YOUR SUPER DISC

Huw Collingbourne's adventure game dips into a stream

Delphi has many advantages over the Java language – for example, it's fast, it's efficient and it's Pascal. But we have to admit that there are some things that Java does better. For one thing, unlike Delphi, Java's object orientation is fairly rigorous. For another thing, Java makes it easy to save and restore the state of your objects to and from disk. An object whose state can be saved is said to be persistent. The ability to save and restore an object's data is called serialization.

In last month's column, we made a start on a project to convert a simple adventure game from Java to Delphi. The Java version is included on the **SuperDisc** in the \JavaWombat directory. From the outset, it was a design goal to preserve a rigorous level of object orientation including data-hiding – so that any data inside an object can only be accessed by get and set methods. This month we'll consider how we can go about implementing a Delphi version of serialization.

Once again, I am going to try to adopt a reasonably 'pure' approach to object orientated programming (OOP). I have therefore decided to encapsulate all the methods (procedures and functions) needed for saving and restoring each object's data within the object itself.

PCPlus SUPER DISC **PATH:** \prog\files\delphi

When we want an object to save itself, we can simply ask it to do so. If one object contains another object of a different type, the first object can ask the second object to save itself. It does not need to know anything about the inner workings of the other object's saving routine.

As long as every object knows how to save its own data, we are free to build structures of arbitrary complexity – lists of objects or even lists of lists of objects.

As long as the lists know how to save themselves, and all the objects in the lists know how to save themselves, we won't have to worry about the details.

It might sound complicated, but the next page and a half makes it all clear. PCP

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NEXT MONTH

Huw finishes his Delphi adventure game and gets it going

The art of streaming in Delphi

We've been working on converting our adventure game from Java to Delphi. To do this, we need to implement a Delphi version of serialization. Here's how to go about it:

Making sure the lists know how to save themselves is easier said than done since traditional Pascal I/O routines for dealing with files aren't suitable for the job. We need to save all kinds of data so we can't use plain text files.

The objects will be of mixed types and varying sizes so we can't use typed files. And while untyped file procedures such as BlockRead and BlockWrite might be used to save an undifferentiated block of data, they won't help us to reconstruct individual objects when we read the data back in.

A better OOP alternative would be to make use of Delphi's streaming capabilities. Streams are sequences of bytes that can store any type of data. In principle, objects should be able to write themselves to a stream and the stream could be saved to disk. The objects could then reconstruct themselves by loading data from the file into a memory stream and reading the data from this stream in the same sequence in which it was saved. The only downside of this is that, unlike Java, Delphi does not provide built-in object serialization so it is up to the programmer to hand-code all the methods needed to write and read data to and from streams.

In Java, the stream objects themselves are given the responsibility for storing the data of other objects. In our own code, we have decided to let the individual objects do their own reading and writing. To see how this has been implemented, load up the wombat3.dpr project and use the Project Manager to display the unit, advobs.pas.

Defining the objects

You will see that we have defined a hierarchy of three objects: ThingOb, ThingHolderOb and RoomOb. The root class here, ThingOb, contains two strings, a name and a description. Its descendant, ThingHolderOb adds a TList which can, in principle, contain a list of indefinite length containing objects of any type. Finally, RoomOb descends from ThingHolderOb (so it automatically inherits the two strings and one TList) and it adds four integers – n, s, w, e – which in the finished game will indicate which room can be entered from each of four exits.

The ThingOb class defines these two methods:

```
procedure WriteToStream( fs : TFileStream ); virtual;
procedure ReadFromStream( fs : TFileStream ); virtual;
```

Both of the descendant classes, ThingHolderOb and RoomOb, define methods with the same name as follows:

```
procedure WriteToStream( fs : TFileStream ); override;
procedure ReadFromStream( fs : TFileStream ); override;
```

Note that the ancestor class declares the procedures as 'virtual' while the descendant class declares them as 'overridden'. When virtual methods are overridden in this way, the correct method for a specific object is determined at runtime. So, for example, let's suppose you have written this:

```
ThingOb.ReadFromStream( fs )
```

Potentially this code could be executed by any of the ThingOb class' descendants such as a RoomOb object. If ReadFromStream were a normal static method, this would throw an exception at runtime since it would execute the ThingOb version of the method rather than the RoomOb version. This would cause it to attempt to read the wrong data – the fields needed to construct a ThingOb rather than a RoomOb.

When ReadFromStream is declared as a virtual method that is overridden by RoomOb. However, Delphi checks on the actual object type at runtime. If it finds that this is a RoomOb, it redirects execution from ThingOb.ReadFromStream to RoomOb.ReadFromStream. We'll see an example of this later on.

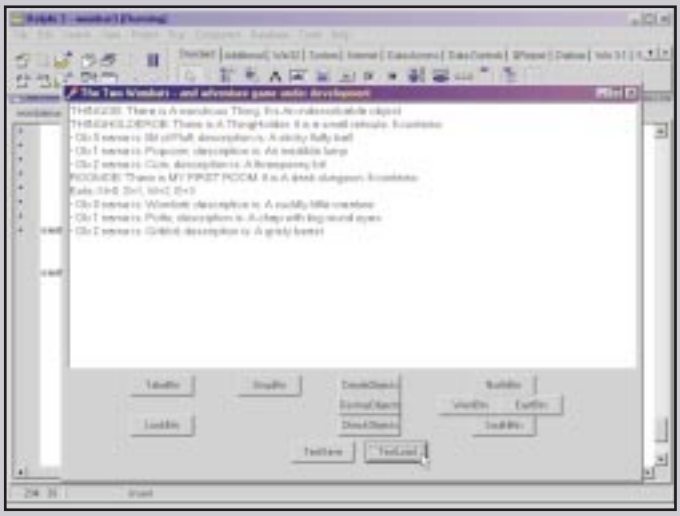
Scroll down to the implementation of the method, ThingOb.WriteToStream(). This takes as a parameter a TFileStream object called fs. This is Delphi's closest equivalent to Java's FileOutputStream. It simply writes all the bytes from ThingOb's two data fields, name and description, to the TFileStream object fs, using the WriteBuffer() method:

```
fs.WriteBuffer( name, sizeof(name));
fs.WriteBuffer( description, sizeof(description));
```

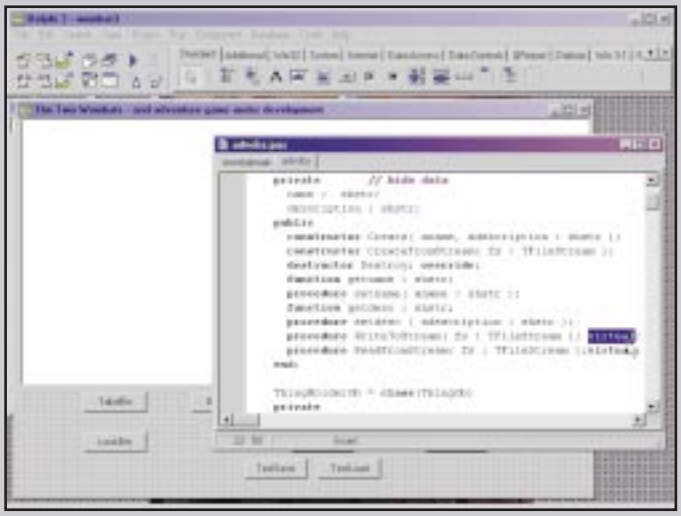
Note that the sizeof() function is used to determine the number of bytes to be written. You will also see that we have added a piece of code to write the class name prior to writing the data:

```
cn := self.classname;
fs.WriteBuffer( cn, sizeof(cn));
```

This is because, in the final version of this program, we want to be able to read back



↑Every decent adventure game has to be able to save and restore itself. The PC Plus adventure game does this using objects.



↑If you've ever wondered what virtual and overridden methods are and what they are used for, this month's project explains all.

mixed lists of objects. By reading the class name first, we will be able to determine which object we'll need to create prior to calling its constructor method.

Stream on

Now find the ThingHolderOb.WriteToStream() method. The interesting feature of this is the code responsible for saving an entire list of objects to a stream. Neither the length of the list nor the types of the objects are known at runtime so this code has to be able to operate on mixed lists of arbitrary length. This sounds as though it should be complicated and yet this is all the code it takes:

```
for i := 0 to things.Count-1 do
  ThingOb(things[i]).WriteToStream( fs );
```

That this feature has been so trivial to code is explained by the fact that all of our objects already know how to save their own data. So all this piece of code has to do is ask each object in turn to write itself on to the stream. This is an example of the value of the overridden method, WriteToStream(). Each item is cast to a ThingOb data type and yet the appropriate WriteToStream() method will automatically be invoked for the descendant ThingHolderOb and RoomOb objects. The value of this will become more obvious in subsequent, more complex, versions of the program which we'll be working on next month.

Now turn to the wombatmain.pas unit. Here, in the CreateObBtnClick method, we create three objects, one of each of the three class types we've defined. The TestSaveBtnClick method creates a file stream associated with the file testfile.txt. Each of the three objects writes its data to this file using its WriteToStream method.

Try it out. Run the program. Click the CreateObjects button. Examine the values of the objects by pressing the CheckObjects button. Now click the TestSave button to save them to disk. Click DestroyObjects to destroy the objects and press CheckObjects to verify this. Now comes the moment of truth. Click the TestLoad button. This attempts to reconstruct the objects from the data saved to disk. Verify this by pressing CheckObjects. All being well, you should see that the objects have been restored to their state just before they were destroyed.

The one thing we haven't yet looked at in the code is the routine that reconstructs the objects from the saved data. Look at the TestLoadBtnClick method. You can see that this calls a method named CreateFromStream for each object type. Switch to advobs.pas. Find the type declaration section at the top of the unit. You can see that CreateFromStream is a constructor – a method responsible for creating an object – and it defined only for the ancestor class, ThingOb, but not for its descendants. This is its implementation:

```
constructor ThingOb.CreateFromStream( fs : TFileStream );
begin
  inherited Create;
  ReadFromStream( fs );
end;
```

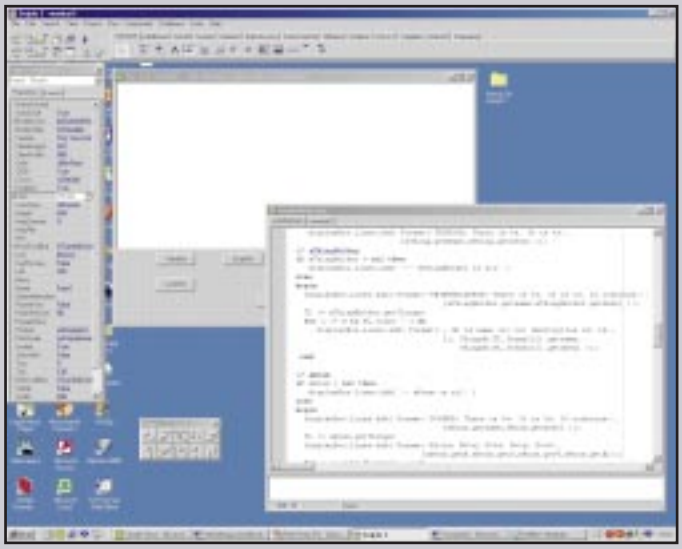
But wait a minute. Since we need to be able to create any of three different types of object from the stored data, how does this code know which particular object type to create at any given moment? The secret lies once again in overridden methods. Recall that ReadFromStream is a virtual method of ThingOb that is overridden in its descendants ThingHolderOb and RoomOb. The code in TestLoadBtnClick specifies which of these object types it wishes to create. This is how we create a new RoomOb from a stream:

```
aRoom := RoomOb.CreateFromStream( fs );
```

In this example, the CreateFromStream constructor of the ancestor class, ThingOb, executes. But when this constructor makes a call to ReadFromStream, Delphi directs execution to the ReadFromStream method of RoomOb rather than of ThingOb.

FORUM **www.pcplus.co.uk/forums/delphi**

You might wonder why we have bothered going to the trouble of making sure these overridden methods work in this way. It is true that in the present project, they aren't really needed. That is because we have just three objects in a fixed order so there is never any doubt about which data we want to save and restore at any given moment. Remember, however, that in the final game we want to be able to have a whole series of rooms, each of which may contain numerous different objects. To complicate matters further, the game player will be able to pick up objects in one room and drop them in another room. So the program will have no way of predicting in advance the number and types of objects in any given room. It is vital, therefore, that our code is sufficiently generic to be able to write and read any type of object it comes across at any position in a list. We'll be finding out how well this succeeds next month.



↑In the final version of this program, I want to be able to read back mixed lists of objects. By reading the class name first, I can determine which object I need to create prior to calling its own constructor method.

Discover Perl: PART FOUR

Using objects in Perl

PCPlus SEE YOUR SUPER DISC

Charlie Stross shows us how to write a class in Perl

Perl 5 is an object-oriented language which you can program without using objects, but much of the elegance and power comes from its OOP features. This month, I'll look at the background knowledge you need to write a class in Perl.

Any object-oriented language needs certain features. It must support encapsulation: a bundle of data should be wrapped up in an object that can only be accessed by invoking a method on it. The two items – methods (subroutines) and objects (data) are defined in a package called a class. The class may inherit methods and objects from a parent class, adding its own methods and data to the newly-defined child class. The information associated with the object is hidden; private data owned by an object shouldn't be (easily) visible outside the object.

First, references (pointers) let you build complex data structures such as trees. Second, Perl provides namespaces as a way of compartmentalising code and data. Normally, any variables or subroutines you create exist in the main namespace. If you specify that an item exists in another namespace, it won't be visible to your main program unless you tell Perl where to find it. The package() command tells Perl that you're defining a package of code and/or data that exists in its own namespace; but if necessary you can specify the namespace that an item belongs to explicitly, outside a package declaration.

PCPlus SUPER DISC **PATH: \prog\files\perl**

Third, Perl provides the bless() function. This tells a piece of data what class it belongs to. A class is a Perl package containing subroutines (methods) that operate on a specific type of data. If you have a blessed variable called $fred, and invoke the menu subroutine through it (by calling $fred->menu()), Perl will look in $fred's class (and any classes it inherits from) for a subroutine called menu(), then apply it to $fred.

Perl classes can inherit methods from parent classes. You may add parent classes by putting their names in an array called @ISA. All Perl classes inherit from a special class called UNIVERSAL, and there's a fun default mechanism called AUTOLOAD which lets you set up a polymorphic method that is triggered whenever you try to use a method that isn't explicitly defined anywhere PCP.

Charlie Stross
cstross@pcpmag.co.uk

PCPlus NEXT MONTH

We put into practice our Perl knowledge, using a database-driven Web site search engine

→ Building Modules

How to create a simple module to track a name and address record

When writing a module it is a good idea to start by designing the data structure underlying it. The next step is to write a class method that returns a new object of the correct type, and then instance methods that operate on a specific object and do useful things.

Note that there's a big difference between a module and a useful chunk of re-usable code. Perl provides a standard mechanism for building redistributable modules, like the ones you can download from CPAN. For a tutorial, bug me or see chapter 12, section 8, Preparing a module for distribution in *The Perl Cookbook* By Tom Christiansen and Nathan Torkington; ISBN 1-56592-243-3.

Here's a very simple module that keeps track of a name-and-address record.

First, we'll call it Address. (If you plan to distribute a public module, contact the CPAN administrators first, and discuss your plans for naming it with them.)

We create a file called Address.pm. We declare it to be package Address (the package() command doesn't need the .pm filename suffix), and make sure that it returns true by ending it with a line that evaluates to true.

Now we ask, what does an address look like? We can represent a person's name and address using an anonymous hash:

```
my $address = {
  "title" => "Mr",
  "forename" => "Charlie",
  "surname" => "Stross",
  "addr1" => "123 Anystreet",
  "addr2" => "Somedistrict",
  "addr3" => "MyTown",
```

References and data types

Know your Perl jargon

→Perl pointers are called references. Unlike a pointer in C, there's no relationship between the value of a reference and a location in memory: it's just a handle Perl uses to refer to an underlying entity like a scalar or an array.

We obtain a pointer to a variable using the backslash operator:

```
$array_ptr = \@array;
```

This is like the C:

```
array_ptr = &array;
```

We can also implicitly build references to arrays and hashes by using square brackets and braces as constructors:

```
$array_ptr = [ 'red', 'blue' ];

$hash_ptr = { 'red' => 'stop', 'amber' => 'caution', 'green' => 'go' };
```

And we can nest constructors:

```
$complex = [ 'red', 'blue', [ 'nested', 'list', 'of', 'other', 'stuff' ] ];

$worse = { 'traffic_lights' => { 'red' => 'stop', 'amber' => 'caution', 'green' => 'go' },
'some_array_ref' => $complex
};
```

We dereference a pointer in a couple of different ways. For example, if we want to get an array from a reference to an array, we assign to our destination array like this:

```
@new_array = @$array_ptr
```

Think of it as replacing the name of @array_ptr with a reference. Or think of it as forcing a list context on to $array_ptr.

Or:

```
%my_hash = %{ $hash_ptr };
```

The enclosing block around the reference causes it to be dereferenced.

When traversing complex, nested data structures we can use the arrow operator to dereference sub-entities:

```
$nested_list = $worse->{some_array_ref}->[2];

# contains an arrayref to [ 'nested', 'list', 'of', 'other', 'stuff' ]
```

```
  "postcode" => "XX1 3YJ",
  "phone" => "1234567",
  "fax" => "1234568"
};
```

Next we must write methods that (a) return an empty object of this type, (b) let us fetch/store values for any of these fields, and maybe (c) do something creative (like print the neatly formatted address).

The class constructor method (to return a new object) we've already seen. The instance access methods (to get/set values) we can do in a couple of ways. We can write a method like this for every named parameter:

```
sub title {
  my $self = shift; # the instance object we're working on
  if (@_) {
  return $self->{title} = shift;
  } else {
  return $self->{title};
  }
}
```

If we call $address->title() with no argument, it returns the current value of the title key; if we call $address->title("Ms"), it sets title to "Ms" and returns it.

With many parameters, this becomes tedious; so we may as well use the AUTOLOAD method. When an unrecognised method name is used, AUTOLOAD is executed; the method name is passed in a variable (local to this package) called $AUTOLOAD:

```
sub AUTOLOAD {
  my ($self) = shift;
  my ($name) = $AUTOLOAD;
  $name =~ s/.*://;
  if (@_) {
  my ($val) = shift;
  # rudimentary type checking
  if (! grep(/$name/, qw(title forename surname addr1 addr2
  addr3 postcode phone fax))) {
  warn "\tno such method: $name\n";
  return undef;
  }
  return $self->{$name} = $val;
  } else {
  return $self->{$name};
  }
}
```

The only real gotcha to note here is how we check the method name ($name) against a list of instance methods we're willing to apply to our object, and reject it if it isn't present.

Finally, we can define a method that does something to our hash. For example, to return a neatly-formatted address string:

```
sub pretty_print {
  my $self = shift;
  my $retvar =
  "Title : " . $self->title() . "\n" .
  "Forename: " . $self->forename() . "\n" .
  "Surname : " . $self->surname() . "\n" .
  "Address : " . $self->addr1() . "\n" .
  " " . $self->addr2() . "\n" .
  " " . $self->addr3() . "\n" .
  "Postcode: " . $self->postcode() . "\n" .
  "Phone : " . $self->phone() . "\n" .
  "Phone #2: " . $self->fax() . "\n\n";
  return $retvar;
}
```

Modules and namespaces

Packages and Perl

A Perl module is defined in a package. A package is a bundle of Perl code and data with its own namespace; it starts with a package declaration, like:

```
  package MyModule;
```

And it must evaluate as true (non-zero); a common idiom in Perl is to end all packages with a line like this:

```
  1;
```

As this is the last expression evaluated, and is non-zero, this ensures that the package declaration is true.

Non-lexically scoped perl variables are stored in a namespace. By default, variables exist in the main namespace; $fred is equivalent to $main::fred, or $::fred (the identifier main is assumed if no namespace is specified). We can override this by specifying that a variable belongs in a different namespace; $MyModule::fred is invisible outside package MyModule unless the namespace specifier is used. (Within the scope of MyModule, $fred refers to $MyModule::fred, not $main::fred.)

Package declarations let us bundle up data that belongs to a module along with its subroutines. For example, a subroutine fred() declared in MyModule is not visible outside that module unless you specify where it's coming from like so: &MyModule::fred(). And it's not visible in main at all, unless somewhere in main we call 'require MyModule', which tells the main program to load MyModule at run-time:

```
  package MyModule;
sub fred {
  :
  }
1; # end of MyModule

  &fred(); # runtime error
– fred isn't visible in
the main namespace

  require 'MyModule'; #
runtime loading of
MyModule

  &MyModule::fred(); # now
this works
```

We can bypass this compartmentalisation of name spaces by explicitly importing names from one package into MAIN, using the import command:

```
  require 'MyModule';
  import MyModule;
```

Import doesn't exist as a separate Perl function; in actual use, it invokes the import() method of MyModule, or the default import() method – it gets a little hairy. There's a full explanation of what's going on here in Chapter 5 of *Programming Perl* by Christiansen, Wall, and Schwartz (ISBN 1-56592-149-6.

The most commonly used, and important mechanism for importing a package is the use() function. This runs at compile-time and implicitly imports entities from the named package into the main namespace:

```
  use MyModule;
```

And indeed, this is how we load classes in Perl so that we can use objects defined in them.

Inheritance and objects

Defining objects is easy

An object, in Perl, is simply a piece of data that remembers what package it belongs to. The subroutines defined in the package are tailored to operate on the piece of data. We associate a piece of data with a package by using the function bless():

```
  my $fred = { "name" =>
"humphrey" };
  bless $fred, person; #
tell $fred that it belongs
to the module 'person'
  $fred->print_name(); #
invoke the subroutine
&person::print_name($fred)
```

Usually, we begin defining a module in a package definition, by writing a constructor method: this is usually called new(), and its job is to return a new object of the appropriate class. Often, the object is simply a hashref that is blessed into the class (and can be used as a record to store various named bits of information).

```
  package Address;

  sub new {
  my $class = shift;
  my $self = {};
  bless $self, $class ||
"Address";
  return $self;
  }
```

Note that we can optionally pass in the class name as a parameter; this is so that if we create a child class we can bless the new object into it correctly.

We can then create a new object of type MyModule in our main program like this:

```
  #!/usr/bin/perl

  use MyModule;

  my $fred = MyModule-
>new();
  my $Joe =
MyModule::new();
```

Both forms of syntax above are valid; they both specify that we use the new() method supplied by MyModule.

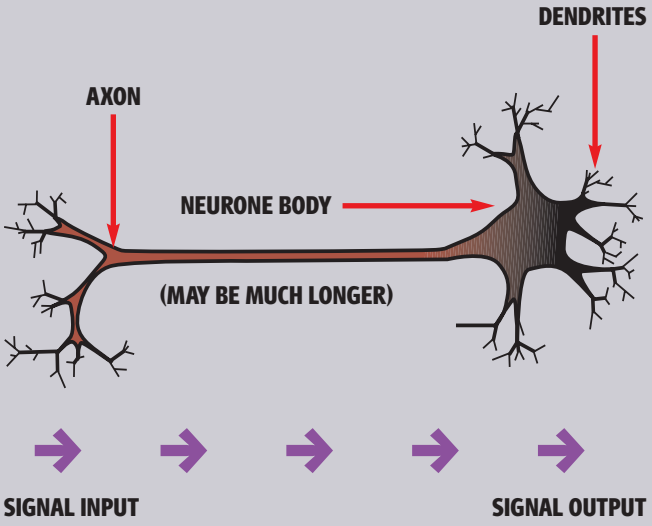
new() is a class method; rather than operating on a specific object, it supplies functionality for the whole class by returning a new object. If you call a method via the object, you are calling an instance method – one that works on a specific instance of a class. It is passed an object as a parameter and does something to that object. Such methods are simply subroutines that expect an object as their first parameter. We write them like this:

```
sub print_myname {
  my $self = shift;
  if (exists $self-
>{myname}) {
  print $self->{myname};
  }
}
```

print_myname() expects to work on an object which is a hashref, with an optional key called 'myname'; if this is present, it prints the associated value.

WILF'S WORKSHOP

Forget everything you know about programming – there is another way of performing computations. **Wilf Hey** examines neural nets



↑ The neurone, principle logical component of the human brain, is like a logic gate, but more complicated in that it commonly takes many inputs, giving different importance (weight) to each input signal.

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Brain waves

PCPlus SUPER DISC **PATH:** \prog\wilf.htm

In the 1950s, several teams of programmers explored ways of modelling human thinking on their computers, some certainly with the goal of creating an artificial intelligence and others with the more mundane objective of developing self-teaching computer systems without reinventing the wheel. They argued that the human brain was the most complex organism in the universe and it did its job as well as we can be expected, so surely we could learn from its structure and methods. Since that time there has been a virtual revolution, and three distinct (but overlapping) fields have developed around this idea: evolutionary computing, neural networks and machine learning.

All three are active research fields, and the first two have practical by-products today. Evolutionary computing turns out to be, in many instances, the most economical way to develop efficient algorithms to perform computations in a great number of instances. Neural networks actually function, and can readily perform jobs such as triage, classification and parsing. They are, in effect, tiny 'brains' themselves.

Smarter thinking

The effectiveness of a human brain lies in the fact that it is skilled at learning and adapting itself, but initially has relatively little information within it. The brain of an insect is brutally efficient; it contains a 'program' that will direct the insect through several important activities (walking, hunting for food, building its nest and so on). However, that brain never develops the same way that a human brain does: it cannot 'learn' from its surroundings and assimilate the kind of information from its environment that can actually modify its 'programming'.

It would be great if we could craft a neural network to be like an ant's brain: completely programmed to do a particular job, and to do it excellently. But that involves writing the 'program' – notoriously difficult and, depending on the job we want it to do, perhaps even impossible for the usual programmer.

We do not require a neural network that is created with a working program within it. What is more helpful is one that has the capacity to learn, and effectively create its own programming. If it can be achieved, this strategy has several important benefits:

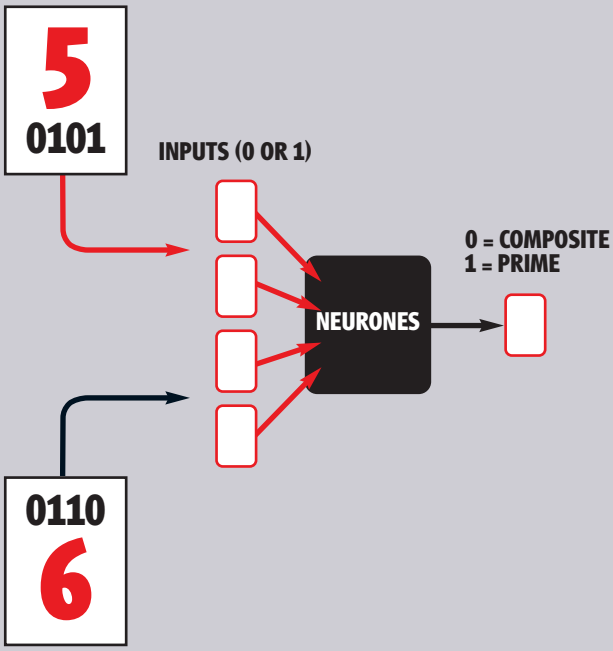
- **The expert neural network makers can do their own job and not concern themselves with programming.**
- **The particular task you may assign to a neural network is unique, and no program has been written yet.**
- **The decision task itself may be subtle, and the people who know how to do it cannot adequately define it for an analyst to be able to create a program.**

These are precisely the conditions that apply to people. We do not (yet) create people to order, with pre-ordained skills and knowledge: we bear and raise children. In the first few years of life, a child learns amazing skills and vast amounts of knowledge, and when formal education starts, the learning process slows dramatically. Who can 'teach' a child to focus eyes, analyse sounds, grasp objects? A successful neural network, then, should be expected to be something like a baby's brain: complex, capable of learning, yet unprogrammed.

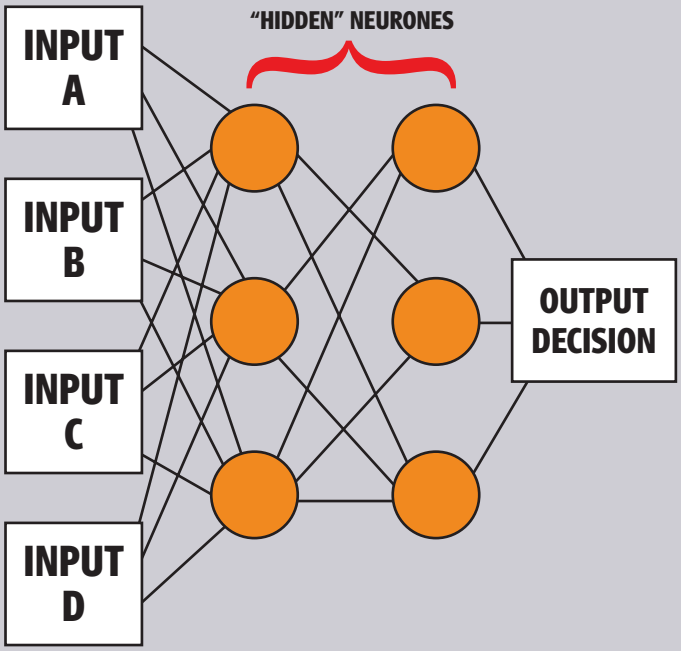
First approximations

When a brand new neural network first tries to recognise an integer, for example, the judgment it supplies is unlikely to be very good: it will make many mistakes, simply because it does not apply the right weights to its decision to fire any particular neurone. But this is where a neural network excels. All it has to do is tweak a few of its weights, and it 'thinks' differently. If the result of this new 'thinking' is more successful, it will adopt these new weights. If not, then it retains the old weights and continues. If you think about it, this means that as long as there is a tutor present who will tell the network when it must adjust its weights, that network can only get better and better in its judgments.

Sorting out which of the first 15 numbers is prime and which is composite is not an awe-inspiring task: you might as well create a little program that looks each up in a list and displays the answer. But then you would be modelling an insect-like brain, hard wired with instinct and incapable of learning new strategies and exhibiting new behaviour. Suppose the problem were not so simple – perhaps a matter of evaluating stock market trends, or the speed of chemical



↑ The input portals to a neural net each connect with many internal neurones. Each connection is like an axon, contributing to the decision whether or not to fire the neurone. The final judgment is treated as a neurone itself.



↑ More often than not, a neural network has more than one 'hidden' layer of neurones, sharing many connections. Every layer affects neurones in the succeeding layer in complex ways because of the different weights applied to each connection.

How a neural net works

Neural nets model the human brain in some important respects. The basic building block of the brain is the neurone, which we looked at briefly in issue 153's *Workshop*. Neurones act like a computer's logic gates, only they are far more sophisticated – they don't have just one or two input signals, but several hundred.

A neurone may pass on a signal based on levels of input, giving more consideration to one axon (input) than another. The interconnection of millions of neurones is what makes the brain so versatile.

In the most common form of neural net, this structure is simulated by connecting cells and applying weights to each connecting line. Typically, every input signal is connected to every 'neurone' cell in a particular region, each connection assigned a 'weight' or significance.

Each 'neurone', based on the sum total of the input signals, either fires or fails to fire, passing on its signal in turn. The net effect of input signals determines what happens to an individual neurone, and the net effect of the state of each neurone determines what happens to the output signal (or signals). Suppose we are trying to sort out prime numbers from composites: in turn each number will appear at the input, and will have some effect on the neurones in the net. Subsequently the neurones themselves have an effect on a 'super-neurone' that announces the result: it fires if the number is prime, fails to fire if the number is composite. Notice that no computation itself has been performed on the number for this network of neurones to arrive at an answer – just the summing of the weighted signals to each neurone.

reactions, or perhaps weather patterns. These cannot be made into pre-cut, pre-assembled bundles of knowledge – or if they can, we don't yet know how to create them. We use this simple example so that the workings of a neural network may be seen more readily.

Connection machines

The network, like the brain it models, has a large number of neurones. But it is not the number of neurones that dictates its effectiveness, it's the interconnections between those neurones. Suppose we have just three neurones in our model, plus the fourth one to display the resulting judgment. The input number in each case (integers up to fifteen) can be rendered within four bits, so we need only have four input ports. Each port is connected to all three of the neurones and these, in turn, are connected to the output neurone. That's a total of fifteen connections.

Each of these connections can be weighted, and therefore have a different impact on the final decision. The three neurones between the input and the output are 'hidden': you do not need to know what is happening there. Now consider what happens if we have a fourth neurone: the number of connections goes up to twenty (sixteen at input, four at output). However, there is a further subtlety we must investigate.

The brain doesn't have a single neurone stretching all the way from input to output: it has banks of neurones in layers. The first layer receives signals direct from the input (which may be, for example, one of your senses). The results from the firings and non-firings of the neurones in this layer are then fed on as input to the next layer of neurones and so on. We can readily simulate this in our imaginary neural network by having four inputs, one output, and two layers of neurones, three in each layer. In a real neural network, there can be any number of input ports and any number of neurones in several layers. (There can be a different number of neurones in each layer). Even a quite low number of neurones in just a few layers can provide enough diversity to store a large amount of information.

The proper working of such a network depends on the weights of each of the connections between inputs, outputs, and neurones: a weight can be any value from –1 to +1, and you can arrange each neurone to 'fire' when the total signal value entering it is positive. For example, suppose a neurone has input connections with weights –0.7 at A, +0.3 at B, and +0.2 at C. This neurone will fire if A is off and either or both B and C are on.

A neural net starts 'life' with random values for its weightings: great capacity and amazing potential, but no content. Inputs are presented and these produce effectively random results at the output node. A tutor will have to judge whether the result is correct, and make adjustments to the weights if they are not. Any change of weights that makes for a better result are adopted, so the network cannot help but 'learn' from its original mistakes.

On the job training

A neural network needs a lot of nurturing while it 'learns' its job. It isn't difficult to see how it could proceed with small steps toward becoming competent, just by tweaking the weights. But how do we accomplish this tweaking? How can we exploit the improvements so that they are accelerated? The answer lies in another one of those three fields that arisen in recent years: evolutionary computing, or 'Artificial Life'.

In the continuation of this article on the **SuperDisc**, we see how 'genetic algorithms' demonstrate the power of evolution, and how to apply such algorithmic power to our neural network. PCP

Write in!

→ I'm always pleased to receive letters and e-mail with programming queries, ideas and opinions, As a strict rule I can't reply directly with personal one-to-one programming advice, but your input could form the basis of a future Workshop. You can e-mail me at whey@pcpmag.co.uk. Fax to 01225 732295 or write to Wilf's Workshop, PC Plus, Future Publishing, 30 Monmouth Street, Bath BA1 2BW.

Discovering XML: PART THREE

How to script an XSL template

PCPlus SEE YOUR SUPER DISC

Dermot Hogan shows us how to transform XML in to HTML text

Last month we looked at XSL and examined how the language used search patterns to locate an XML fragment or sub-tree in the main XML tree and used a Visual Basic program to extract the XML sub-tree and display it. This month we look at transforming the XML tree into HTML text. But as XSL is often used in HTML operations, it makes sense to examine another way of using Visual Basic – scripting.

Scripting means lightweight embedded code used within another program environment to extend the original program's functionality. A good example is JavaScript expanding the capabilities of Netscape Navigator. The Java in JavaScript has nothing whatsoever to do with the Java language, by the way: JavaScript was originally called LiveScript by Netscape. Some bright spark then thought he saw a marketing opportunity and tried to jump on the real Java bandwagon, and renamed LiveScript to JavaScript to the confusion of many thereafter.

Microsoft has its own version of JavaScript, Jscript, but also supports another scripting language that's more familiar to Visual Basic users, VBScript. As to which one to use, you pays your money and takes your choice. Or not, since they're all free. JavaScript, Jscript and VBScript also do more or less the same thing. But since Microsoft doesn't (yet) control the browser market, you won't find many examples of VBScript embedded in HTML pages. However, for programming Microsoft technologies, COM in particular, VBScript is a slightly better bet than the alternatives. PCP

PCPlus SUPER DISC **PATH:** \prog\files\vbwkshp

Dermot Hogan
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PCPlus

NEXT MONTH

We look at some more XSL constructs and finish off by constructing a database application using HTML, VBScript and XSL

Starting VBScript

Where and how to host VBScript

VBScript must be hosted in another environment to run. There are two convenient ones – Internet Explorer 5 (IE5) and the Scripting Host. We won't look at the Scripting Host here, since all it does is run VBScript code. We're more interested in seeing the output from our script, so IE5 is the best option. Within an HTML page, you specify a script by enclosing it in the tags ‹SCRIPT› ... ‹/SCRIPT›

```
<SCRIPT language="VBScript">
function hw()
  hw = "hello, world"
end function
</SCRIPT>
```

The language parameter selects between various scripting languages such as JavaScript or Jscript, but below that the function text is pure Visual Basic. Note that the function doesn't have an AS return type. That's because in VBScript, you can only return a variant, so it isn't needed. Similarly, you don't need to DIM something AS a type – you just use the DIM keyword:

```
Dim x, y, z
```

You can call the function by using some more script, embedded in HTML:

```
<P>script start</P>
<P style ="color:red">
  <SCRIPT language="VBScript">
  document.write(hw())
  </SCRIPT>
</P>
<P>script end</P>
```

We've used a small bit of Dynamic HTML, document.write, to get the output of the function, hw, to the screen. DHTML is a fairly big topic in its own right and we won't do more than touch on it here. The whole HTML page is on the **SuperDisc** in the file test1.htm. If you look at this, you'll see that the hw function is defined in SCRIPT tags in the header section of the HTML, while the code that calls hw is in the HTML body. There's no very good reason for this – it's largely convention.

Now that we've seen how to include some Visual Basic code, we need to include the XML that we've been looking at. This can easily be done using a data island. A data island is just a chunk of XML text embedded in HTML inside the tags ‹XML› ... ‹/XSL›:

```
<XML id="xmltext" src="pcplus.xml"></XML>
```

You can either include the text directly between the XML tags or include it using the src directive as we've done here. The XML text is exactly the same as that we used last month. One important point to note here is the DHTML id field. This allows us to reference the XML text directly – we can then set a variable to the text, as follows:

```
set x = xmltext.documentElement
```

We can then perform operations similar to those we were doing last month:

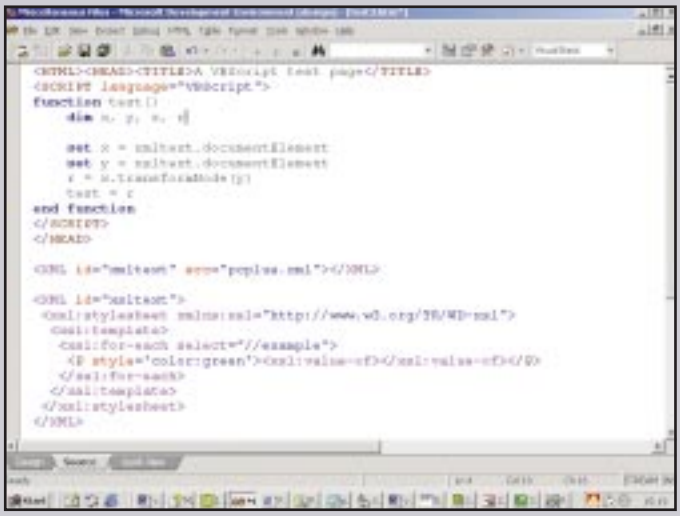
```
function test()
  dim x, y, z, r

  set x = xmltext.documentElement
  set y = x.selectNodes("//example")
  for each z in y
    r = r & "<P style='color:blue'>" & z.text & "</P>"
  next
  test = r
end function
```

Here, the function test returns a string constructed from the example elements (those XML parts included in the ‹EXAMPLE› ... ‹/EXAMPLE› tags) by using an XSL search pattern '//example' as we described last month. The complete file is on the **SuperDisc** in test2.htm.

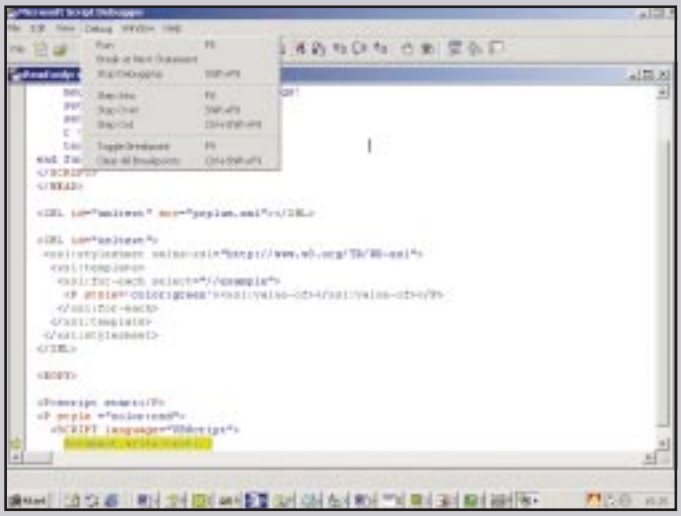
Now we've got to the point that we were at last month, but using Internet Explorer 5, VBScript and XML data islands. You might think that this looks a lot simpler than messing around in an expensive Visual Basic programming environment when you can do the whole job a lot more simply using free software. True, but only up to a point. Just try debugging a long and complicated script like this and you'll appreciate why Visual Basic as a program isn't going to disappear just yet!

XSL itself

Back to XSL now. Similarly to XML, XSL can be included in a HTML file using a data island in exactly the same way as XML (don't forget – XSL is XML):



↑Here's the source code for the final example. We've used Visual Interdev to edit the HTML/XML/XSL and VBScript and to display the result. It's not really necessary – but it's a lot easier than using Notepad!



↑One problem with VBScript is the rather limited debugging facilities available. You can use the Script Debugger, but it's a poor relation of the full thing available in Visual Basic itself.

```
<XML id="xsltext">
  <xsl:stylesheet xmlns:xsl="http://www.w3.org/TR/WD-xsl">
  <xsl:template>
  <xsl:for-each select="//example">
  <P style='color:green'><xsl:value-of /></P>
  </xsl:for-each>
  </xsl:template>
  </xsl:stylesheet>
</XML>
```

Here, the first line tells the XSL parser that it is indeed XSL. The next line introduces an XSL template. XSL works by matching templates against the XML tree. If a template matches, then the XSL code inside the template is activated. The template here has no selection criterion, so it will match anything and will be activated (see below). The next line, ‹xsl:for-each› introduces the basic XSL looping construct and a selection criterion. Many XSL constructs look something like this:

```
<xsl:something select='selection text'>
```

where the something is only activated when the selection text is matched – it's sort of a tree based key-in-a-lock processing. If there is no select specified, then the action will always be activated whatever the text in the XML tree is at that point. In fact, this is why the xsl:template works: it matches the whole tree.

The selection criterion we've chosen, //example, is the same as we've used before. It selects all ‹EXAMPLE› ... ‹/EXAMPLE› sub-trees in the source XML tree. Having matched some XML text, the inner XSL code is executed. This consists of the text

```
<P style='color:green'><xsl:value-of /></P>
```

a combination of HTML and XSL. If the XSL parser finds some valid XML text which isn't an XSL keyword, it just spits it out as output. Here, the ‹P› ... ‹/P› is indeed valid XML text (as well as being perfectly good HTML text) and will be sent to the output. Inside the ‹P› ... ‹/P› is, however, another piece of XSL. ‹xsl:value-of /› simply gets the text of the current XSL context – and note the abbreviated XML form of an empty XML tag pair. Being in a for-each loop, the inner text is run for each ‹EXAMPLE› in the collection.

But how do you tell the XSL parser to do its stuff in the first place? All you need to do is call 'transformNode' which (as its name suggests) transforms one set of XML nodes into another using an XSL template:

```
set x = xmltext.documentElement
set y = xsltext.documentElement
r = x.transformNode(y)
```

Here, we've set x to point to the XML text to be transformed (our **PC Plus** article database from last month) and y to the XSL text (above) that contains the template. The work is done by calling transform Node with the XSL template as the argument and the output – being HTML text – is placed into a variable, r. The complete file is in test3.htm.

Finally, we'll look at how you can perform a simple test in XSL. Don't forget that XSL is primarily a style sheet language – not a full blown programming system, so you can expect things like conditionals to be a bit simplistic (primitive would be a better description). Tests are done in XSL by using the ‹xsl:if› tag:

```
<xsl:if test=".[.='delphi166.exe']">
<P style='color:green'><xsl:value-of></xsl:value-of></P>
</xsl:if>
```

This is in test4.htm. The syntax of the test expression needs a bit of explanation. A more normal way of expressing this might be to say:

```
<xsl:if test="delphi166.exe">
```

But this won't produce the correct results. Instead, you have to select the current element (the position in the XML tree) – that's the first '.' – then, since this is a collection, you need to subscript it – hence the square brackets. Finally, you need to compare each element of the collection with the value you want to select – that's the second '.' and '='. Actually, this isn't a very good way to select the value that we're looking for, since we're in a loop; it's better to select from the tree collection directly. But it's the sort of contortion you have to go through sometimes to get the result you want. Like Unix regular expressions, it can be a bit confusing at first until you get the hang of it.

FORUM **www.pcplus.co.uk/forums/vb**

What's VBScript?

It's slow, it's relatively inflexible, so why use it? It turns out that it has a few handy extras which can give it an edge over Visual Basic...

→VBScript is supposed to be a strict subset of the real thing, Visual Basic.

In practice, it isn't quite like that. VBScript is in many ways a cut-down version of the full blown Visual Basic programming language.

But it's also got some highly useful extensions – run time code evaluation and a decent regular expression search to name just two.

Thee main restrictions in VBScript are, first, it's not compiled so it's slow. If you need speed, it's far better to write the main component in a compiled language, C++ say or Visual Basic, build a COM object then call that from the script rather than write a huge and complicated script program.

Scripts are intended to be lightweight and small – though that's not how things turn out sometimes. The second major difference is that there's only one type of variable in VBScript – a variant.

There are other differences as well, mainly because of the environment. Forms are treated differently from Visual Basic, for example, and input/output isn't done using the standard Visual Basic methods.

And while we're on the subject of differences, it's a good place to point out that these days Visual Basic for Applications (VBA) – the glue that is used to join up Microsoft products – is, essentially, good old Visual Basic itself.

Apart from not being able to compile VBA, the syntax is just the same as that in the full Visual Basic programming environment.

Huw Collingbourne

In this month's Rants and Raves, Huw comes to the end of an intimate relationship and decides to go cruising for some old-fashioned company

I **have** come to the end of my tether with Microsoft Word. We've worked together day in day out for more years than I care to remember. I thought we trusted one another. But now I feel that Word has been deceiving me. With its fancy new ways and its tendency to corrupt my work, it seems better for both of us that we go our separate ways...

Having come to this decision, I initially felt a sense of elation. Freedom! I was alone again, without any ties or commitments. But then grim reality set in. I turned on the PC and the screen was blank. Never again would I click 'Bullets and Numbering'. Never again would I hear the pitter-patter of the Office Assistant's tiny feet. I realised I needed to find a new word processor and fast. But where's a guy to go to satisfy these needs? I searched the small ads, looking for familiar names from the past. Maybe I could get together with WordStar, have a tete-à-tete with MultiMate or a good workout with Sprint? But, no, their names were nowhere to be seen. I searched in vain for Volkswriter, XYWrite, PC-Write, TopCopy, Q&AWrite and Manuscript. Gone, all gone.

↑ **The simplicity of WordExpress looked attractive. I soon discovered that it was just a bit too simple though – when you make as many mistakes as I do, one level of Undo just ain't enough.**

Lost for words

Not so many years ago, it would have been possible to fill several pages of **PC Plus** with listings of word processors. Now, you can pretty well reduce the list to just three products – Corel WordPerfect, Lotus WordPro and Microsoft Word. Each of these word processors forms part of a larger package – an 'office suite'. People used to buy single applications. If you wanted a database or a word processor then that's what you'd buy. These days, you buy applications by the bundle and just cross your fingers that the application you really want – in my case, the word processor – is good as you are hoping for. Which Microsoft Word isn't.

"With Word's fancy new ways and its tendency to corrupt my work, it seems better for us that we go our separate ways..."

Long ago, in the days when Simon Le Bon was a sex symbol and DOS applications roamed the earth, the PC's top word processor was WordPerfect. It was great! It didn't clutter the screen with formatting codes like WordStar, menus like MultiMate or window frames like that young upstart, Microsoft Word. It just showed your words.

If you were determined to see what was going on 'behind the scenes', you could do so by opening up a 'reveal codes' window that showed the codes that turned on formatting effects such as Bold, Italic or Justified. All in all, it was a brilliant design which was justifiably successful.

And then along came Windows. This was the software equivalent of Talking Pictures. When they tried to switch to the Talkies, many silent stars such as Buster Keaton and Theda Bara fell by the wayside. WordPerfect was similarly unsuccessful as transferring to Windows. Early versions were slow, under-featured and lacked the 'clean screen' look that characterised the DOS product. If WordPerfect was the Theda Bara of Windows, Microsoft Word was the Marlene Dietrich. A minor starlet in the silent world of DOS, it blossomed into a Windows mega-star. But perhaps now, at long last, the tide is ready to turn again? Maybe Word has outlived its welcome and WordPerfect is ready to make a comeback?

When I installed the latest version of WordPerfect, I was pleasantly surprised to find that it still has its Reveal Codes window. Unlike its DOS ancestor, it is no longer limited to loading just two documents at a time, which is good news. But, it is limited to editing each individual document in a single window. which is bad news. Word, by contrast, lets you load a single document into numerous different windows and split each window into horizontal panes. This deficiency of WordPerfect is a significant drawback if you are working with long documents in which you may want to open multiple viewports on to different parts of the text.

Another deficiency is its outliner which I find curiously awkward to use. Whereas Word lets you expand and collapse outline levels by clicking little cross-symbols shown in the text, WordPerfect makes heavy use of outlining icons at the top of the screen. It is also pretty slow and can cause a disagreeable amount of screen flicker.

Star struck

Maybe WordPerfect, like Word, is just too big and complex for my requirements? They both contain all kinds of graphics, data-management, table and calculation features that I never ever use. Strange as it may seem, all I want to do in a word processor is to process words.

Finding a word processor that specialises in words rather than graphics and fancy formatting is easier said than done. After hours searching around the Internet, however, I finally chanced upon a product called WordExpress that sounded as though it should fit the bill: "Whether you're looking for your first word processor, upgrading from a 'Works' program you've quickly outgrown, or are just tired of waiting for your over-inflated megalo-word processor to boot up, WordExpress is for you." Or so says the Web site.

↑ **WordPerfect's Reveal Codes window – shown at the bottom of the picture – has a nostalgic appeal. But I'm not impressed by its outliner or windows. And what became of its 'clean screen' interface?**

WordExpress has most of the features you would have expected of a good word processor in the early 1990s including graphics, tables, a thesaurus and a spell checker. It even has a reasonable collapsible outliner which is a good deal simpler to use than the one in WordPerfect. It hasn't got all the features you'll find in one of today's big-name word processors though – there are no integrated drawing tools, programming language, 'office assistant' or auto-formatting wizards. So what? I can live without those!

There are other limitations I'm not so happy about, though. For one thing, in common with WordPerfect, it does not let you edit a single document in multiple windows. But the real killer is the lack of a multiple-undo facility. I complained last month about the lack of multi-level undo and redo in DTP packages such as PageMaker and QuarkXpress. I'm afraid this is one thing that I really cannot do without in a word processor. So in spite of its good points, WordExpress is not for me.

The next word processor I decided to try was, frankly, a bit of a long shot. Not only does StarWriter come from Sun – a company better known for its hardware than for the quality of its software – but it's also free! In fact, my copy comes from the **PC Plus SuperDisc** (the Windows version on the November 1999 CD – a Linux version was provided on the December CD).

I only installed StarWriter to see if it could help me restore data from a long (10,000 word) document which Word had corrupted so badly that it could no longer load it from disk. Every time I opened the file, Word performed an illegal operation (it told me) and then self-destructed. I tried loading the document into WordPad. That too performed an illegal operation and bombed out.

This posed a problem. The way to recover data from a corrupted document is to load it up and save it in a different file format. But when you can't load the document, this is not an option. Swearing at Word didn't help me get back my data. Installing StarWriter, on the other hand, did. StarWriter can load files in a variety of formats, including Word. It loaded my corrupted document without complaint and so I was able to restore every last one of my 10,000 words.

After breathing a sigh of relief, I decided it might be worth taking the time to see if StarWriter had any other neat tricks up its sleeve. I have to say that my initial impressions of this program are surprisingly favourable and I'll have more to say about it next month.

Take an inch...

One of the curiosities of word processing software is the optional measurement systems they provide – points or picas for the use of artists and designers, centimetres or inches for the rest of us. I wonder what percentage of British users choose old-fashioned inches rather than gleaming new centimetres? Even now, almost 30 years after our currency went decimal, it's pretty obvious that the Great British public has taken to metrication like a duck to orange sauce.

Instead of replacing one system with another, we've just jumbled them all together and ignored the bits we don't like. So we buy petrol by the litre and drive by the mile. Our clothes are measured in inches but our curtains are measured in metres. Our milk is sold in bottles containing the bizarre metric quantity of 2.272 litres which, by a curious coincidence, comes to the rather neat Imperial quantity of 4 pints. Our marmalade comes in jars containing 454 grams which, by an equally curious coincidence, comes to precisely one pound. Where Metrication is concerned, one might say that we are keeping to the letter of the Litre but not to the spirit of the centimetre.

Let me be the first to own up that I am one of the worst offenders when it comes to mixing and matching measurements. For some reason, I find low temperatures easy to understand in Centigrade (-2°C sounds colder than 28°F) but I find high temperatures easier in Fahrenheit. If someone says it's "in the 90s", I think "Phew! What a scorcher!" but if someone says it's "in the 30s" I start looking for a woolly jumper.

Metric measurements are convenient for programmers. Adding, subtracting and multiplying in tens is child's play whereas twelves (inches in a foot), sixteens (ounces in a pound) and eights (pints in a gallon) are more complicated.

But while these dimensions may be inconvenient to computers, they come more naturally to people. My feet are nearer to a foot in length than a metre, I generally prefer to have my beer in pints rather than litres (unless the Editor's paying, that is) – and, let's face it, an inch or two in the right place can make all the difference. So, for once, I'm with the Americans on this. While the rest of the world seems intent on metrication, the USA is sticking to ounces, pounds and miles. Which probably explains why I have a 17-inch monitor, a 3 1/2-inch disk drive and why metres and centimetres get right on my threepenny bits... PCP

huwcol@aol.com
www.treetops.u-net.com

Contacts

FURTHER READING

If you need to contact any of the suppliers of the products mentioned here take a look at the following resources

WordPerfect Office 2000
Price £278 (£232 ex VAT)
Corel 0800 581028
www.corel.com

WordExpress
Price £49 (£42 ex VAT)
Microvision/Thompson Partnership
01889 564601
mvd.com/wordexpress/index.htm

StarOffice 5.1
Price Free
Sun Microsystems
www.sun.com/staroffice

Microsoft Office 2000
Price from £439 (£374 ex VAT)
Microsoft 0345 002000
www.Microsoft.com

£800 PCs
home vs work

A PC for use in a small or home business needs to be solid, reliable and to run all the regular software you'll be using. But does this mean it's useless for more leisure-oriented purposes? Simon Williams discovers some good news

Business doesn't have to be conducted in a Dilbert-style maze of cubicles, but can take many forms, from big offices, to varying proportions of telework, to a complete home enterprise. These changes in the way we work, made possible by the ever-present invasion of the Internet, have meant more and more people are doing at least some of their work at home.

To work effectively this way, you need a PC and that PC needs to be capable of running all current business applications. While you won't need the high-end graphics of a graphic artist's workstation or the multimedia and 3D power of a games PC, you will still need enough in the graphics and sound areas for the occasion round of Tetris or to play your Brotherhood of Man CD (or not).

A typical business PC today may have a Celeron, Duron, Pentium III or Athlon processor, with 64 or 128MB of memory and a hard drive of around 10MB. This is a more than adequate specification for word processing, spreadsheets, e-mail, Internet browsing, desktop publishing and most other things your work might involve.

Screen sizes continue to increase, so we expected most of the machines in this group to come with 17-inch monitors and we weren't disappointed. The extra size gives you a much larger desktop to work with, which can be very useful if you're using more than one application at a time. They're not just for spectacular scenery in Tomb Raider.

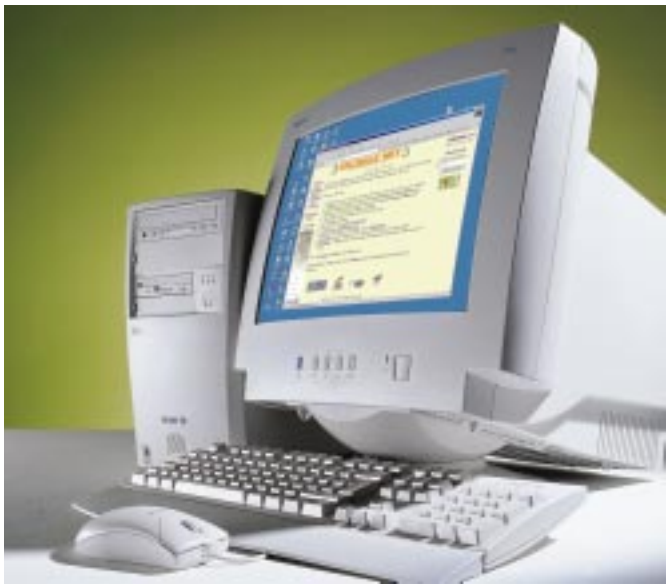
Finally a price point. We said around £800 and most suppliers came in within £20 of this. There's no need to spend £1,500 or so on a business PC any more, prices continue to fall and you can get a near-ideal machine for half this. As you will see...

Choosing a DVD or CD player

§If you're buying a PC which will be used in the home, many suppliers will offer a DVD drive as the main read-only storage device. If you can see the machine being used for leisure – playing back DVD movies or running multimedia encyclopaedias, for example – as well as work, a DVD drive may be useful.

Many people, though, will want to keep a home office machine purely for business applications and in these circumstances, there's a better choice. Think seriously about requesting your supplier to fit a CD-RW drive. A rewritable CD drive gives you the opportunity to run ordinary CDs, data or audio, to write CD-Rs, which are currently the most cost-effective form of removable storage, and to handle CD-RW. CD-RW disks can be written many times over, so if you have data which changes regularly, but which doesn't need archiving as an audit trail, the CD-RW is an ideal solution.

Modern CD-RW drives can write at 8 to 10-speed and read standard CDs at 32-speed or faster, so you lose little in playback performance. Although a CD-RW drive may add £40-£50 to the cost of a new PC, over a DVD, for business it's a much more useful device.



Acer AcerPower SN

PRICE £857 **EX VAT** £729 **SUPPLIER** Acer
PHONE 01753 699200 **ONLINE** www.aceruk.co.uk

Acer may call its range AcerPower, but this one's slightly lacking, judging by our power tests

What you get

Acer's machine is specifically designed for business use and dispenses with things like speakers. This isn't necessarily a problem, as more than one sound-equipped PC in an office can cause conflict – if only in musical taste.

This is a 700MHz Pentium III machine, with 64MB of memory and a 9.5GB Seagate hard drive. There's a 48-speed Acer CD-ROM drive and a floppy on the front panel and sound is available from a Crystalware sound chip on the system board. Surprisingly there's no modem included, which is fine if you're connecting up to an Intranet – a network adapter is included – but it will be missed in most home offices.

Acer's own 17-inch monitor gives a good display and is driven by a 16MB ATI Rage 128 graphics adapter. It sits in an AGP slot, so you can upgrade later if necessary.

In use

The performance of this machine was adequate, though lower than we expected. When you consider that Dan's 566MHz Celeron machine beat this 700MHz PIII, you realise that paper specifications don't always match real-world results. The Rage 128 graphics card gave Video 2000 results that were lower than most in the group, too, including Compaq's Presario. Even so, for general-purpose office applications, there's more than enough processing power.

Service and Support

The company provides a fairly reasonable three year warranty with the AcerPower SN, the first year of which is on-site. The remaining two years are return-to-base.

Conclusion

Acer was concerned before supplying a machine for this review that the system it was sending was intended specifically for office applications and we accept that sound systems and 3D graphics aren't needed in most business environments.

However, we were disappointed by the missing modem and with the overall performance of the AcerPower SN which didn't come up to the lower clock-rate Celeron or Duron systems from other suppliers. The network adapter will be useful to some, but overall this isn't a high-value system.

PCPlus Verdict

ACER ACERPOWER

✓FOR	✗ AGAINST
→ Clearly pitched as an office machine	→ Not great value compared to alternatives

Specifications	8
Quality	8
Value	6
Performance	7
OVERALL	**7**

Carrera Octan M700

PRICE £821 **EX VAT** £699 **SUPPLIER** Carrera
PHONE 0208 307 2800 **ONLINE** www.carrera.co.uk

Carrera included everything we asked for and then some. A strong performance and good components

What you get

The Octan M700 uses Carrera's normal midi tower case to house a 10-speed DVD drive, better than many suppliers' CDs, and runs it with a standard floppy and a 12.6GB IBM hard drive. This is all good stuff and the processor, a 700MHz Athlon with 64MB of memory, runs well, too. The system comes with a SoundBlaster 128 card, which like the 56K Rockwell modem, plugs into a Biostar system board.

Graphics support is provided by a Riva TNT2 card from nVidia, with 32MB of graphics memory and it drives a 17-inch LG monitor.

The keyboard and mouse are an excellent Key Tronics and Microsoft combination and the software bundle comprises SmartSuite Millennium and two Norton utilities.

In use

The Octan performed well, though we did have some problems getting the Video 2000 benchmark to complete. This was fixed by changing graphics drivers. A **PC Plus** Benchmark of 1.36 shows that the Athlon-based Octan is around a third faster than our 500MHz Celeron reference machine. Video 2000 showed that the machine was well capable of playing back DVD movies, as well.

The monitor gives a stable and detailed picture, with only slight curvature to the screen, and contrast and focus are good. Although not designed for 3D work, the nVidia card gives fair performance, so the odd game is within its capabilities, too.

Service and support

Carrera provides a two-year on-site warranty with the Octan, which is better than most suppliers in this group. It has a two working day turn-out, so you shouldn't be without your machine for too long, if it does hit problems.

Unlimited telephone-based technical support is also included in the deal.

Conclusion

Carrera's Octan M700 is a well designed machine with plenty of punch for all kind of office-oriented applications and tasks.

While it's more than a match for any word processor, it will be able to handle more esoteric applications, like DTP and Web design, too. Great value in a system costing under £850.

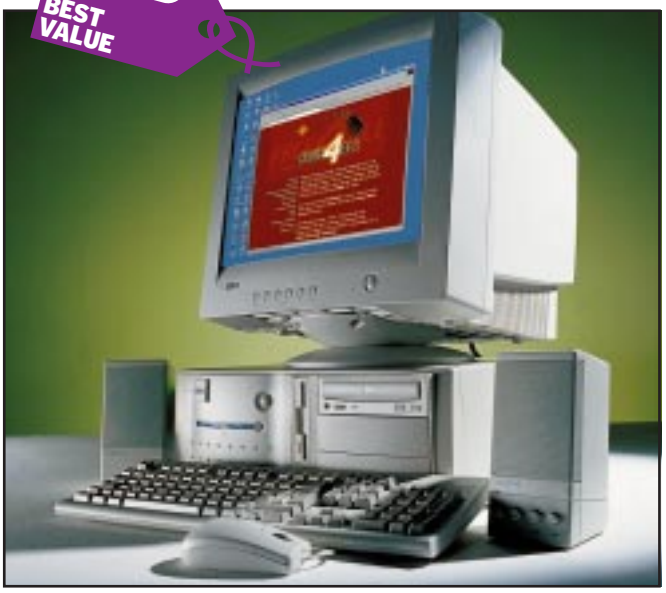
PCPlus Verdict

CARRERA OCTAN M700

✓FOR	✗ AGAINST
→ Plenty of punch for all kind of work, including Web design and DTP	→ Slightly underpowered 3D card

Specifications	8
Quality	9
Value	9
Performance	10
OVERALL	**9**

PCPlus BEST VALUE



Dan Dantum CFM

PRICE £820 **EX VAT**£698 **SUPPLIER** Dan
PHONE 0208 830 1100 **ONLINE** www.dan.co.uk

Dan's Dantum CFM has a lot of good things packed into its desktop case

What you get

Dan built its Dantum CFM into a small-footprint desktop case. A 40-speed CD drive accompanies a standard floppy, with a high capacity 19.1GB Western Digital hard drive inside for permanent storage. The processor is a 566MHz Celeron, coupled to 128MB of memory, perhaps over the top in this configuration.

Sound is provided by the VIA chipset on the Asus system board and runs to a workaday pair of Creative speakers.

There's a 56K modem fitted in one of five PCI slots and the AGP slot contains a 16MB ATI Rage Fury Xpert 128 graphics adapter, complete with TV output.

This feeds to a 17-inch Dan-badged CTX monitor and the system is completed by an MS Intellimouse, an average keyboard and a copy of SmartSuite Millennium.

In use

The Dantum ran without problem through all our benchmarks – always a good sign. The Celeron 566 gave a good account of itself too, returning a **PC Plus** Benchmark of 1.13 and the Video 2000 index of 1,539 showed the ATI graphics card to be good on 2D tasks, too. The extra main memory could be one factor in this.

The machine completed 3DMark 2000 well enough, but was much happier at the lower 800 x 600 resolution, slowing to 1,450 at 1,024 x 768.

Service and support

Dan offers a basic one year back to base warranty, covering parts and labour, plus lifetime labour cover after that.

Dan's legendary reputation for after-sales service has been earned over the years by the company's excellent approach to customers with problems, so that is a reassuring point to consider.

Conclusion

The Dantum CFM is well capable of all the basic business tasks you may charge it with. In strictly hardware terms, it isn't as punchy as some of the other machines in this group, but its highlights are extra memory, the high capacity hard drive and the fine 17-inch monitor, which gives a clear, detailed picture. Its performance is good for a 566MHz Celeron and overall it represents very good value for money.

PCPlus Verdict

DAN DANTUM CFM

✓FOR
- Great service and support
- Extra memory and hard drive

✗ AGAINST
- In strict hardware terms, there's better value available

Specifications	8
Quality	9
Value	10
Performance	8
OVERALL	**9**

Elonex WebRider

PRICE £817 **EX VAT** £695 **SUPPLIER** Elonex
PHONE 08000 37465 **ONLINE** www.elonex.co.uk

WebRider is a neat, well-built machine, but without the performance – or modem – of most of the others

What you get

Yet another WebRider with yet another specification inside the case. Confused? We are.

This is a mini-tower cased PC built around a Celeron 633, the highest clock-rate Celeron in the group. It has 128MB of memory, which is more than enough to run anything you'll want to do this year, and a 19GB hard drive, which is enough to store it.

In the front panel is a 50-speed Acer CD-ROM and an LS120 Superdisk instead of a straight floppy. That's the good news.

The MicroATX system board from Microstar has just two PCI slots, both free which leaves limited room for a network card, SCSI controller, Firewire controller or whatever. The machine was supplied without a modem, as Elonex is still testing the unit, but it will be supplied with customer's machines.

There's an AGP slot, containing an nVidia Vanta chip, but with only 8MB of memory.

This feeds a 17-inch Elonex monitor which gives a good, stable picture, and there's a copy of Lotus SmartSuite Millennium to display on it.

In use

The WebRider performed adequately, though its **PC Plus** Benchmark was near-identical to the Celeron 566MHz in Dan's machine. The WebRider wouldn't run the Video 2000 benchmark, we suspect because of the small amount of memory on the graphics card and produced fairly feeble results on the 3DMark benchmark, though this is of less importance on a business PC.

Service and support

Elonex provides a one-year, on-site warranty with this WebRider. Turnaround is usually next working day, though this can depend on the nature of the fault. This is normally assessed over the phone by one of Elonex's operators.

Conclusion

This WebRider is well put together and will make a fair home office machine for most people.

We'd like to see a system board with more room for expansion, though. It's compact and easy to set up, but the performance is nothing special and when you look at the competition ranged against it, it doesn't seem particularly good value.

PCPlus Verdict

ELONEX WEBRIDER

✓FOR
- A bit cramped when it comes to expansion
- Performance nothing great

✗ AGAINST
- Not great value

Specifications	8
Quality	9
Value	6
Performance	7
OVERALL	**8**

Evesham.com Duron 650

PRICE £880 **EX VAT** £749 **SUPPLIER** Evesham.com
PHONE 0800 0380800 **ONLINE** www.evesham.com

The first appearance of AMD's answer to the Celeron processor – but is it any better?

What you get

Evesham is the first company we've seen to have produced a stable PC using the new Duron processor. This is AMD's answer to the Celeron, but based on this first outing, it doesn't seem to have pulled the same trick as the Athlon did on the Pentium III.

Evesham tucked a Duron 650 into a new, Socket A system board from Microstar, though this is a micro ATX format board, offering little expansion potential.

It has just three PCI slots, one of which is filled by a 56K modem, but it does retain an AGP slot for graphics cards.

Before we get there, though, there's a 48-speed CD-ROM drive in the midi-tower case with a floppy below and a 14.2GB hard drive, again from Samsung, inside.

The Riva TNT2 graphics adapter runs to a 17-inch Vibrant monitor, which unfortunately isn't quite as well focused as the LG with the Carrera or DCS's Iiyama.

Evesham supplies a fair keyboard and mouse combination and bundles the above average Works Suite 2000 to give you a good start with your work.

In use

The **PC Plus** Benchmark of 1.11 is more than adequate for most business applications, but is slightly lower than Dan's result from a 566MHz Celeron. 3D performance was much better, particularly at the top 1,024 x 768 resolution and the Video 2000 figure was also good, but there's no doubt the SYSmark result was disappointing.

Service and support

Evesham offers a two-year, on-site warranty with the Duron 650, which is a lot better than most machines in this price band.

It can be very comforting to know the machine you depend on will be fixed next working day by Evesham's own engineers, if anything does go wrong.

Conclusion

It's interesting to see the first appearance of the Duron but first impressions aren't great.

Evesham may have got the Duron running reliably, but the performance we saw was nothing startling and certainly not a match for some Celerons.

Otherwise, the machine is well specified, well built and comes with a good software bundle which helps add value.

PCPlus Verdict

EVESHAM.COM DURON 650

✓FOR	✗ AGAINST
→ Well specified	→ Disappointed with the Duron processor on this showing
→ Well built	
→ Good software	

Specifications	8
Quality	9
Value	8
Performance	8
OVERALL	**8**

Mill-Tek Office-Star 700

PRICE £822 **PRICE ex VAT** £700 **SUPPLIER** Mill-Tek
PHONE 01395 233001

Mill-Tek's Office-Star 700 is a fair system for offices, particularly if you prefer Windows 2000 to 98

What you get

Mill-Tek is a regional supplier, providing a lot of systems to the MoD in the South West, but also selling direct to the public. Its Office-Star 700 system was supplied by them at short notice when another supplier failed to meet our deadline.

The midi-tower case contains a 52-speed CD-ROM drive and a standard floppy, with a 12.7GB hard drive partitioned in two as permanent storage.

There's plenty of room for expansion in this machine, with PCI and an ISA slot available. SoundBlaster sound is feed to a fair pair of Taiwanese speakers.

Graphics come from an 8MB ATI Xpert 98 card and feed to a 15-inch AOC monitor, which flickers with a top refresh rate of 60Hz at 1,024 x 768. Mill-Tek provided Works Suite 2000 on its machine, but put it on top of Windows 2000, when we requested Windows 98.

In use

We had to start by connecting the Office-Star's hard drive up ourselves – we know it was short notice, fellas, but surely you tried to power the system up before you sent it to us?

Once running, there were some other intermittent faults, including screen corruption and a floppy drive which wouldn't read a test floppy. Not encouraging.

The **PC Plus** Benchmark was low for a 700MHz Athlon, around 24 per cent slower than Carrera's Octan, for instance. The Video 2000 result was low, too, with an index of 1,029. This is mainly down to the ATI graphics card, which is looking rather tired now.

Service and support

Mill-Tek provides a one year, back to base warranty, though there's a separate three year warranty on the AOC monitor. This type of extra warranty on displays is reasonably common.

Conclusion

Despite a few quibbles on the build – some of which can be put down to getting us out of a hole – this is basically a sound machine.

It may not be one of the fastest Athlon 700s we've seen, but it's still fast enough for all typical office applications. Whether or not the extra power offered by having Windows2000 swings this your way depends on your office requirements.

PCPlus Verdict

MILL-TEK OFFICE-STAR 700

✓FOR	✗ AGAINST
→ A sound machine	→ Sloppy hardware setup
	→ Poor monitor

Specifications	7
Quality	6
Value	7
Performance	7
OVERALL	**7**

Quantex M667S

PRICE £821 **EX VAT** £699 **SUPPLIER** Quantex
PHONE 01438 224444 **ONLINE** www.qtx.co.uk

Quantex's M667S is a well made machine with good performance and an above-average software bundle

What you get

Quantex provides its economically named M667S in a midi tower case, with a 10-speed DVD drive in the top bay and a standard floppy below this.

The hard drive is a 14.2GB Maxtor device and supports the Pentium III 667 and its 64MB of memory. The Biostar MicroATX system board provides no ISA slots and no AGP slot, either.

This unfortunately means you're stuck with graphics provided by Intel's 810E chipset. Graphics are at best average and Quantex's 17-inch monitor isn't the most well-focused device on which to display them, either.

Sound comes from a Crystal sound chip and feeds to a pair of Altec Lansing ACS 22's, giving above-average response in this group. The keyboard and mouse are a fair match and are reasonably comfortable in use.

Quantex bundled the WordPerfect 2000 integrated suite and the good old Grolier Encyclopaedia. Our review sample also came with Adaptec software for CD recording, which was odd as it has no CD-R drive.

In use

The SYSmark benchmark gave a **PC Plus** Benchmark of 1.23, beaten only by the Carrera and DCS systems. The Video 2000 result wasn't as good, though, thanks to the graphics 'abilities' of the 810 chip. 3DMark still has trouble running on machines with the 810 chipset, though MadOnion is working with Intel to fix this.

Service and support

Quantex provides a basic one year, back to base warranty with the M667S, which is no more than required by law. As with most supplies, extra cover is available at extra cost.

Conclusion

Overall, the Quantex M667S is a good all-round business PC. It comes with a strong processor, which performs well, and a good suite of software – an encyclopaedia can be very useful in many areas of work and Grolier's is a good one.

Mainstream performance is strong, but on the down side, you can't upgrade the 810 chipset graphics, which holds the system back. Even if it costs more, we suggest you insist on a system board with an AGP slot.

PCPlus Verdict

QUANTEX M667S

✓FOR	✗ AGAINST
→ Strong all-round performer	→ Lack of upgradability on the graphics front

Specifications	7
Quality	8
Value	8
Performance	7
OVERALL	**8**

Viglen HomePro P3733SLR

PRICE £821 **EX VAT** £699 **SUPPLIER** Viglen
PHONE 0208 758 7000 **ONLINE** www.viglen.co.uk

Viglen's HomePro is a good machine with a fast processor, but no upgrade option for its graphics

What you get

Viglen's HomePro P3733SLR lives in Viglen's four-bay, midi-tower case and uses the top bay for a 48-speed, Samsung CD-ROM drive and the top 3.5-inch bay for an LS-120 SuperDisk.

Unlike Elonex, Viglen supplies a 120MB disk with the Superdisk drive. Inside, there's a 9.5GB Fujitsu hard drive, which is comparatively small, supporting a 733MHz Pentium III, which is comparatively fast. The processor has 64MB of memory to play with.

The system board is another MicroATX design, with just three PCI slots. Two of these are filled by a V90 modem and a 10/100 Base T Ethernet network card. It's good to see both these facilities, but you're still stuck with graphics from Intel's 810E support chipset. Sound feeds from Crystalware sound circuitry to an excellent, three-unit Altec Lansing speaker set.

A software bundle of Microsoft's Works Suite 2000 and three reference and tutorial titles gives the system one of the best software complements in the group.

In use

In use, the HomePro gave good results under SYSmark and, surprisingly, under 3DMark, too. This is the first 810 chipset machine we've seen that runs 3DMark without problem – it obviously can be done. The results were good at 800 x 600, and the display ran well on the 15-inch ADi monitor. Video 2000 produced a below-average result, held down by the 810 graphics.

Service and Support

Viglen provides a one year, on-site warranty with the HomePro, which is a bit above the minimum. Viglen includes the delivery charge for the machine in the price – it's up to £40 extra, elsewhere.

Conclusion

Viglen has produced a good machine in the HomePro P373SLR. It may be cursed by the unexpandable MicroATX system board, which allows for no replacement graphics card – or anything much else, but what it already does is good. Being equipped for home networks and connection to the Internet makes it very versatile, and although the screen is small, it gives a good picture. Overall, it's a machine well worth considering.

PCPlus Verdict

VIGLEN HOMEPRO P373SLR

✓FOR	✗ AGAINST
→ Versatile → Ideal for home networks and the Net	→ Inflexible system board → Small screen

Specifications	8
Quality	9
Value	9
Performance	8
OVERALL	**8**

PCPlus EDITOR'S CHOICE

PCPlus BENCHMARK 1.54

DCS Dionysus

PRICE £822 **EX VAT** £700 **SUPPLIER** DCS **PHONE** 0121 414 7555 **ONLINE** www.dcsplc.co.uk

DCS may have named its Dionysus machine after the god of wine, but was stone-cold sober when it was designed

We've decided to try a slightly different approach with our winning PC from now. Giving it more space helps us talk more in-depth about what it does better.

What you get

It's hard to believe DCS can produce its Dionysus for £822. The specification starts with an 800MHz Athlon, the highest clock-rate processor in the group, and is coupled to 128MB of memory. Supporting this is a 14.2GB IBM DeskStar hard drive, which DCS claims will run at up to Ultra-DMA66+ standard, giving a burst transfer rate of 100MB/s.

Under normal use, you wouldn't see much difference in this faster hard drive and controller, but DCS is obviously looking at the longer term with this one.

The Abit system board supports four IDE sockets, all offering Ultra-DMA66+ support and providing for a total of eight drives.

The BIOS includes routines for setting these up as a RAID 0 array, with striping and mirroring, giving a good basis for a network or maybe Internet server.

Once you have two or more drives in the machine you can get this software to copy everything you write to one disk to the other, too (mirroring), or to spilt it across several drives (striping), which increases the average read and write speeds dramatically.

The CD drive is a CD-RW from HP, the only one in the group. See our separate boxout (page 38) on the advantages of a CD-RW drive in business PCs, and you'll realise that most of your back-up requirements are sorted out by the inclusion of this drive.

Sound comes from a SoundBlaster Live! Value card and runs to a set of Creative's PC Works speakers. While these aren't hi-fi speakers, they do include a sub-bass unit and four satellites, so you get improved bass response and a better experience if you do indulge in the occasional game.

Unusually, the Riva TNT2 graphics adapter is AGP 4x compatible. This means it can make use of the extra bandwidth this new version of the AGP bus can support. The card runs a fine 17-inch Iiyama monitor which gives a clear, stable picture with good contrast. While it's not one of the premium VisionMaster Pro range, it's still a very good monitor, with sharply focused pixels on a high-contrast background. Controls are easy to use, too, so set-up and adjustment aren't a problem.

SmartSuite and CD-RW utilities are bundled with the Dionysus and the keyboard and mouse combination is a top-rate Key Tronics and Microsoft Intellimouse pairing. Both these devices are comfortable to use, even when you're typing for most of the day.

In use

Although we started with the green blocks display problem we've seen on other systems, changing graphics drivers cured it and after that things ran smoothly.

The SYSmark result was well ahead of the field, giving a **PC Plus** Benchmark of 1.53. This is around 12 per cent faster than Carrera's machine, the next quickest in the group. 3DMark showed what the Riva TNT2 is still capable of, particularly when using an AGP 4x connection. The index actually increased at the higher resolution of 1,024 x 768, to a very respectable 2,082. Although not aimed at games, this machine would still be more than capable of running the current crop with little problem.

Only the Video 2000 results were in the same space as the others in the group.

Service and support

DCS is based on the campuses of Birmingham and Loughborough Universities and supplies a lot of machines to these institutions and their students as well as selling to the general public.

The company offers a five year, back to base warranty, with the first year including parts and the last four labour only. As Dan Technology managed to work out, if you're employing service engineers anyway, it costs no more to keep them fully occupied, so free labour in warranties is an affordable expense.

Conclusion

This is an amazing machine at the price point.

In almost all areas, it offers something above and beyond the specification of its competition – so much so, we had to double-check the price.

It caters for everything you might want to do in a home or small business office now, but offers huge scope for expansion, too. As you expand your business, the Dionysus could be used in many different ways, ensuring it will have a long and valued life.

PCPlus Verdict

DCS DIONYSUS

☑ FOR	☒ AGAINST
→ An amazing machine at the price point	→ Very little

Specifications	10
Quality	9
Value	10
Performance	10
OVERALL	**10**

Dionysus' best features

The specs were so good at the price we had to double-check them. This is what you get:

1

2

3

4

1 CD-RW DRIVE
Alone among the machines supplied for this review, the Dionysus includes a CD-RW drive. This type of drive can write CD-RW and CD-R disks as well as reading regular audio and data CDs. The HP SureStore is a good example of the breed and comes complete with media.

2 HARD DRIVE
The 14.2GB hard drive is a good size, but also handles Ultra DMA 66+, with a theoretical transfer rate of up to 100MB/s. The hard drive controllers can handle up to eight drives between them and can configure them as a RAID array for future expansion.

3 PROCESSOR
The 800MHz Athlon processor was the fastest fitted to any PC in the group. This is the chip that you would have been hard pushed to find in a PC costing less than £1,500 six months ago. It's backed up by 128MB of memory here, too, providing plenty of elbow room.

4 MONITOR
Seven of the nine machines in the group come with 17-inch monitors, but the Iiyama S700JT1 is arguable the best in the group. Good convergence, a high contrast screen and an easy-to-use control panel all work towards making this a desirable display.

Which £800 PC?

Check the specs here...

CONTACTS	AcerPower SN	Octan M700	Dantum CFM	Dionysus
Supplier	Acer	Carrera	Dan	DCS
Supplier type	Dealer	Direct	Direct	Direct
Telephone number	01753 699200	0208 307 2805	0208 830 1100	0121 414 7555
Price	£857 (£729 ex VAT)	£821 (£699 ex VAT)	£820 (£698 ex VAT)	£822 (£670 ex VAT)
Warranty	3 years, 2 years back to base	2 years on-site	1 year back to base plus lifetime labour	1 year back to base plus 4 years labour
Delivery charge		£34	£22	£35
Credit card surcharge		None	None	2 per cent
SPECIFICATIONS				
Proc. type –Speed (MHz)	Pentium III – 700	Athlon – 700	Celeron E – 566	Athlon – 800
Chipset – Bus speed (MHz)	ALi M1621 – 100	AMD 751/6 – 100	VIA C6942 – 66	VIA KX133 – 100
System board	Microstar MS-6323	Microstar MS-6340	Biostar M6TWL	Viglen VIG132D
Available memory (MB)	64	64	128	128
Maximum memory (MB)	512	768	1.5GB	2GB
Secondary cache (K)	256	512	128	512
Hard drive capacity (GB)	9.5	12.6	19.1	14.2
Hard drive make	Seagate	IBM	Western Digital	IBM
CD-ROM make – speed	Acer – 48x	Panasonic – DVD 10x	Sony – 40x	HP CD-RW – 24x
Other drives and devices	Floppy, 10/100Base T Ethernet adapter	Floppy, Rockwell 56K modem	Floppy, 56K modem	Magix Xpress 56K modem
EXPANDABILITY				
ISA Expansion slots – free	0	2 – 2	1 – 1	1 – 1
PCI Exp slots – free, AGP	3 – 2, 1	5 – 3, 1	5 – 4, 1	6 – 4, 1
Serial ports	2 x 9, 2 x USB	2 x 9, 2 x USB	1 x 9, 2 x USB	2 x 9, 2 x USB
Parallel	1	1	1	1
VISUALS				
Monitor	Acer 77C	LG SW775N	Compaq MV520	Iiyama S700JT1
quoted diagonal (inches)	17	17	17	17
measured diagonal (inches)	16	16	16	16
dot pitch (mm)	0.27	0.27	0.26	0.28
Video adapter	ATI Rage 128	nVidia Riva TNT2	ATI Fury Xpert 128	Ctech Desperado
Video memory (MB)	16	32	16	32
SOUND				
Sound card	Crystal Snd Fusion	Creative SB128	VIA	SB Live! 1024 Value
Speakers	None	Altec Lans ACS22	Creative	Creative PC Works
EXTRAS				
Make of mouse	Acer	Microsoft	MS Intellimouse	MS Intellimouse
Operating system	Windows 98 SE	Windows 98 SE	Windows 98 SE	Windows 98 SE
Bundled software	PC Doctore, PC-Cillin, CD utils	SmartSuite Millennium, Norton Ghost, Norton AV, DVD/ modem/sound utils	SmartSuite Millennium, CD/modem/sound utils	SmartSuite Millennium, CD-RW/modem/sound utils
BIOS make	Acer/Award	Award	Award	Award
Power – Suspend (W)	137 – 55	175 – 48	142 – 60	175 – 96
Faults as supplied	Screen break up in 3DMark	Problem running Video 2000	None	None
VERDICT	**7**	**9**	**8**	**10**



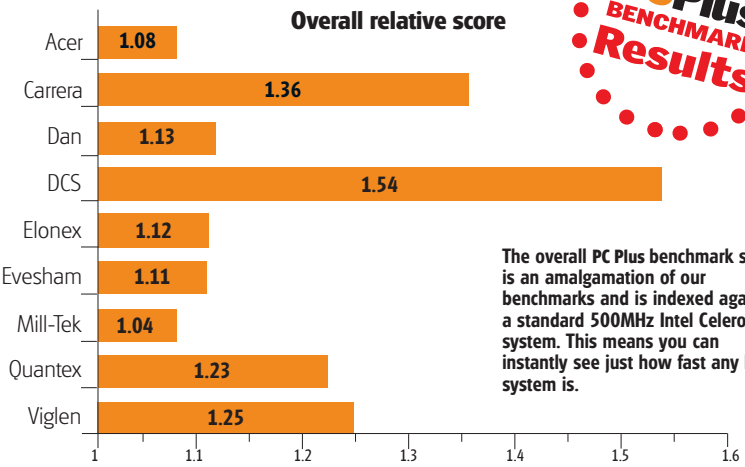


WebRider	Duron 650	Office-Star 700	M667S	HomePro P3733SLR
Elonex	Evesham	Mill-Tek	Quantex	Viglen
Direct	Direct	Direct	Direct	Direct
08000 374465	0800 038 0800	01395 233001	01438 224444	0208 758 7000
£817 (£695 ex VAT)	£880 (£749 ex VAT)	£822 (£700 ex VAT)	£821 (£699 ex VAT)	£821 (£699 ex VAT)
1 year on-site	2 years on-site	1 year back to base	1 year back to base	1 year on-site
£18	£34	£29	£40	Included
None	None	None	None	None
Celeron – 633	Duron – 650	Athlon – 700	Pentium III – 666	Pentium III – 733
VIA Apollo Pro 133A – 66	VIA KZ133 – 100	AMD 751 – 100	Intel 810E – 100	Intel 810E – 100
Microstar MS-6323	Microstar MS-6340	FIC SD11	Biostar M6TWL	Viglen VIG132D
128	64	64	64	64
1GB	1GB	768	512	512
128	64	512	256	256
19	14.2	12.7	14.2	9.52
Fujitsu	Samsung	Fujitsu	Maxtor	Fujitsu
Acer – CD 50x	Samsung – CD 48x	Delta – CD 52x	Toshiba – DVD 10x	Samsung – CD 48x
LS-120, 56K modem	Floppy, 56K modem	Floppy, 56K modem 10/100 Ethernet card	Floppy, V90 modem	LS-120, 56K modem,
0	0	1 – 1	0	0
2 – 2, 1	3 – 2, 1	5 – 3, 1	3 – 2, 0	2 – 1, 0
2 x 9, 2 x USB	2 x 9, 2 x USB	1 x 9, 2 x USB	1 x 9, 2 x USB	1 x 9, 2 x USB
1	1	1	1	1
Elonex M787	Vibrant VM71RDA	AOC Spectrum 5Elr	Quantex XP170DP	ADi ProVista E44
17	17	15	17	15
16	16	13.75	16	13.75
0.28	0.28	0.28	0.28	0.28
nVIDIA Vanta	nVIDIA Riva TNT2	ATI Xpert 98	Intel 810	Intel 810
8	32	8	4MB + main mem	4MB + main mem
VIA PCI Audio	VIA PCI Audio	Creative SB 128 PCI	Intel 810	Intel 810
Creative	Evesham	320WT	Altec Lans ACS22	Altec Lans ACS33
MS Intellimouse	Logitech Pilot Plus	MS Intellimouse	Microsoft	MS Intellimouse
Windows 98 SE	Windows 98 SE	Windows 2000	Windows 98 SE	Windows 98 SE
SmartSuite Mill, CD/modem/sound utils	Works Suite 2000, CD/modem/sound utils	Works Suite 2000, CD/modem/sound utils	WordPerfect Office 2000, Grolier Encyc, McAfee AV, DVD/modem/sound utils	Works Suite 2000, Home Tutor,Oxford Int Encyc, Cyber Patrol, CD/modem/ sound utils
Award	Award	AMI	Award	Award
56 – 65	156 – 53	149 – 55	118 – 53	166 – 60
Wouldn't run	None	HD not connected, screen corruption	None	None
8	**8**	**7**	**8**	**8**

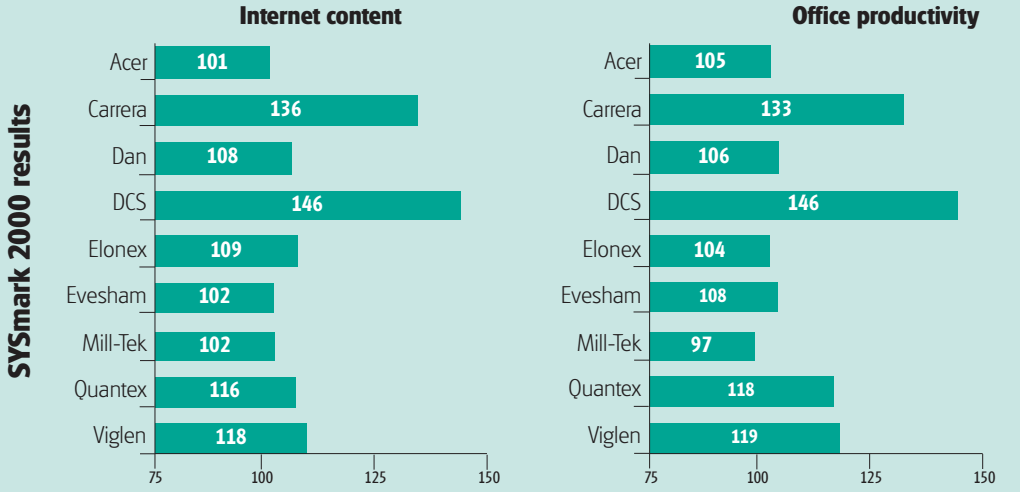
PC Plus benchmarks

Our benchmark is designed to provide a quick and thorough guide to overall system performance. We test individual aspects of performance.

For full in-depth details on how our benchmarking system works, please visit **www.pcplus.co.uk/bench**.

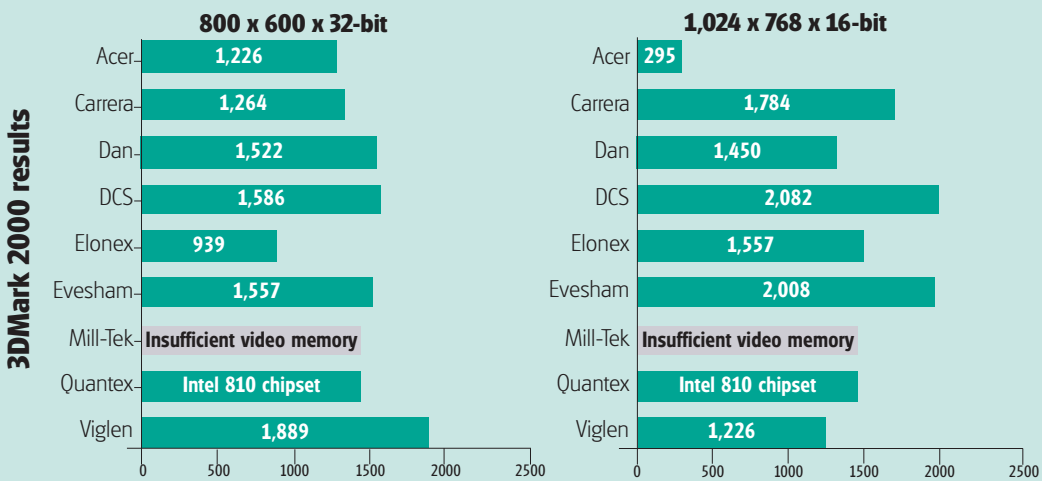


The overall PC Plus benchmark score is an amalgamation of our benchmarks and is indexed against a standard 500MHz Intel Celeron system. This means you can instantly see just how fast any PC system is.



SYSmark2000 puts each system through 12 timed scripts using Microsoft Word, Excel, PowerPoint, Adobe Photoshop, Premiere and CorelDRAW among others. The results are averaged to produce two results, one gives the power of a PC for office applications and the other for Internet content creation.

Video2000 tests the performance of MPEG decompression – this means you get a sense of how good the system is at playing video.



We use 3DMark running at two resolutions. This assesses the suitability of a PC for 3D games and rendering applications.

PCPlus VERDICT

Work-oriented PCs can vary a lot in specification and usefulness, as this group shows. You can do worth-while work with any of the systems here, but some are more worth while than others – these are the best

Analysis

WHICH MONITOR?

Size in monitors is everything, says Simon Williams

10 years ago, 15-inch monitors used to flicker like mad when you upped the resolution to 1,024 x 768. Then, and ever since then, I've always checked small monitors coming through the labs to see how well they do at this resolution.

17 vs 15

17-inch monitors are, as you'd expect, fine It's pretty much the default resolution for this size of monitor. 15-inch monitors are in at a sort of crossover.

Many people will usually choose to run their monitors at 800 x 600 pixels, but the higher resolution is also quite workable, as long as the screen doesn't flicker. In other words, you need a refresh rate of 70Hz or more.

Refresh rates

The refresh rate is the number of times the complete picture is redrawn on the screen in a second. 70 times per second is about the minimum, before most people start to notice a flicker – if your eyes are particularly sensitive to it, you may be able to sense a slight flicker even at 70Hz, but for most of us this refresh rate gives a solid picture.

Eye strain

So, why are so many 15-inch monitors still made with a maximum refresh rate of 60Hz at 1,024 x 768? Cost, of course, is the main reason, but I wonder why this aspect of a monitor's design hasn't advanced at the same rate as virtually every other technology in a PC.

I also wonder if there are a lot of people out there cursing their PCs for giving them headaches and not realising it's their flickering displays.

EDITOR'S CHOICE

DCS Dionysus

PRICE £822 **EX VAT** £700 **SUPPLIER** DCS
PHONE 0121 414 7555 **ONLINE** www.dcsplc.co.uk

↑This month's best buy.

It's not often you see a machine which is head and shoulders ahead of the others it's competing against, but the DCS Dionysus is.

For a start, it has a processor with a high clock rate and produces the highest **PC Plus** benchmark. Then it has a full 17-inch monitor which gives a better picture than most in the group, and couples it to a fast AGP 4x Chaintech graphics card.

It has a CD-RW drive as standard, a better choice for a business machine than a DVD in our view, and a RAID controller built onto the system board.

Although not of immediate value as it stands, the extra facilities in this controller open the opportunity of expanding the machine into a network or Internet server at a later date. DCS has thought hard about the Dionysus and combined an excellent set of components into a fast, high value system.

PERFORMANCE AWARD

Carrera Octan M700

PRICE £821 **EX VAT** £699 **SUPPLIER** Carrera
PHONE 0208 307 2805 **ONLINE** www.carrera.co.uk

Carrera put a 700MHz Athlon to good use in its Octan M700, coupling the fast processor to 64MB of memory and a 32MB Riva TNT2 graphics card. The 17-inch LG Studioworks monitor showed the graphics off to their best advantage and the Octan produced the second best **PC Plus** benchmark in the group, only beaten by the Dionysus.

VALUE AWARD

Dan Dantum CFM

PRICE £820 **EX VAT** £698 **SUPPLIER** Dan Technology
PHONE 0208 830 1100 **ONLINE** www.dan.co.uk

Dan took a different approach and although its 566MHz Celeron couldn't match either of the other two winners on performance, the machine carries 128MB of memory and a 19GB hard drive to add extra value to its configuration. Its 17-inch CTX monitor is high quality and its video and 3D performance is all you're going to need.

Other notables

Most of the machines in this group had something noteworthy in their make-up. Acer and Viglen included Ethernet cards in their machines, for example, which was very sensible, even for a home office. Many families now own two PCs, and linking them together is a very convenient way of moving files around the house or sharing resources like printers and modems. Acer, unfortunately, didn't include a modem in its machine, though. Software bundles varied from no applications at all to Works Suite 2000 and some extras. Works Suite 2000 is almost the ideal suite for a small or home business, as it's neither too small to cope with serious work, nor too vast and complex for a beginner to be able to work his or her way around. The best deal in software is on the Viglen. Too many suppliers are relying on Intel's 810 chipset for graphics and sound. As you may have gathered, we're not over-impressed with this chip, but at least those systems with an AGP socket can be upgraded if you, too, begin to see its limitations. The best graphics are on the 32MB cards found on the Carrera, DCS and Evesham.

NETWORK CONNECTION

Belkin USB Direct Connect

PRICE £60 **EX VAT** £51 **SUPPLIER** Belkin **PHONE** 01604 678 300
ONLINE www.belkin.com

An easy-to-use network which enables you to exchange files and share a printer

→ **Once you've run the Belkin set up it will appear as a normal network connection in the control panel. Any protocols can added or removed in the normal way.**

If you're looking to network a couple of machines together, then Belkin may have the answer. Provided both machines have a free USB port, you won't even need to open your machines to set up a fully functioning peer-to-peer network. Belkin's Direct Connect kit comes with two 1.8m USB device cables and a 'Direct Connect Adaptor'. This is a small plastic module about the size of a mouse with connections for two USB cables.

To install the network you need your Windows 98 CD and the software installation disk supplied by Belkin. Plug the USB cables into an available connector on each machine and join the two together with the USB adaptor, this is powered by the USB cable so you won't need any mains connection or transformers.

When you switch on each machine, Windows recognises a new USB device and asks you for the source disk for the drivers and so on. Once these are installed on each machine, the set up program leaves a shortcut on the desktop. If you double-click on this, you'll start the 'Netsetup' routine to configure your operating system for networking with the Belkin adaptor.

You have the choice of a typical or advanced installation. We tried both – the typical installation is the easier. You supply a name for your machine and another for the workgroup. Machine names need to be unique for each one you're installing but they all need to have the same workgroup name.

Once you've personalised your machines, the next step is to sort out an IP address for them. This is a group of four numbers that uniquely identify each machine. There is a set of standard conventions used in IP addressing and, with this adaptor the software, can be installed to automatically assign an address each time you start. However, Belkin recommends entering one manually as this speeds up identification.

Next, you will need your operating system CD to copy the relevant Windows Networking files on to your hard drive. A final reboot and you should have communication between the two machines. To find one machine from another, you have to open a new icon called Network Neighbourhood on the desktop.

Any drives, printers or storage devices attached to a machine have to be shared before another machine can use them. By default, the Belkin installation sets the file and printer sharing option on. Check and modify any network settings from control panel using the network icon.

We tested data transfer times by moving a range of files between two test machines. File sizes ranged from 10x10MB to 1000x10KB and, although file speeds are acceptable for smaller file sizes, we failed to achieve the claimed 12,000KB/second. If you're planning to shift any large files between machines then be prepared to wait.

It is possible to connect more than two machines using extra adaptors and cables in either a daisy chain or tree configuration. But if you're thinking of going down this route we would strongly recommend looking at an Ethernet set up.

As a replacement for a program like LapLink, or for mobile use, this is a great piece of equipment but it does get expensive compared with an orthodox network. If you're moving around from site to site transferring data it could become indispensable. You won't have the aggro of finding the right cable to connect up serial or parallel ports (provided your equipment has a USB port).

And just imagine playing Quake between two laptops on the train home. Perhaps Virgin will lay on a dedicated games carriage for enthusiasts.

Paul Warner

Requirements
USB Port on both machines
Tested on
K6-200 with 32MB RAM

→ Transfer Rate

Size/Number files	Time to transfer	Speed MB/sec
1x10MB	25 seconds	0.40
10x10MB	264 seconds	0.38
1x10KB	Under 1 second	0.15 approx
1,000x10KB	99 seconds	0.10

PCPlus Verdict

BELKIN USB DIRECT CONNECT

✓**FOR**
→ Easy to use and ideal for file exchange and printer sharing between two machines

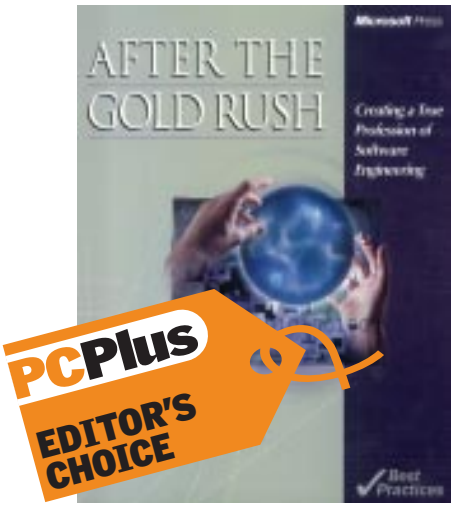
✗**AGAINST**
→ Not a cheap option for a dedicated network and slower than Ethernet

Specification 8
Quality 8
Performance 7
Value for money 8

OVERALL 8

Essential reading

Wilf Hey looks at developments in computer science, e-mail protocols and a beginner's guide to XHTML



mspress.microsoft.com

After the Gold Rush

A must for all software development professionals

PRICE £16.99
FORMAT Book
AUTHOR Steve McConnell
PUBLISHER Microsoft Press
ISBN 0-7356-0877-6

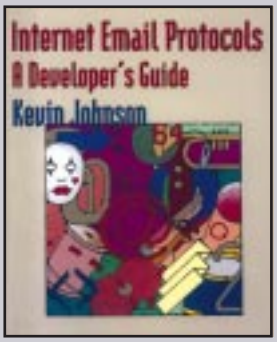
In this seminal and important book, Steve McConnell sets out the premise that "it's time for software development to grow up." In fourteen interesting, well-illustrated and readable chapters he explores where developments in computer science have brought us, what the implications have been for the way we work, and how we can improve immensely the skills that apply to our industry. He demonstrates that disciplines, procedures and even ethics can be brought together to create the true professional role of 'software engineer'.

These pages bring to life the concept of the consummate professional who can honestly state that his field is 'software engineering'. The book's title alludes to the Californian gold rush of 1849 (though there have been similar occasions all over the world) where discovery and technology accelerated amazingly, and untrained people found themselves in key roles. In the gold rush, amateur prospectors made fortunes on the strength of some work plus, frankly, good luck.

← Can computer science really be compared with the Wild West?

After the gold rush passed, it was left to the conscientious few to make the gold mining industry stable and continually profitable. The author says it is time to approach the creation and management of software solutions in this stable, professional, diligent way. He does this by showing the immediate benefits of organised methods, and discusses the future benefits. An excellent, readable and inspiring book to all who are in any way involved in software – whether in its use, design, creation, sales or management.

PCPlus Verdict 10/10



PRICE £34.39
FORMAT Book/CD
AUTHOR Kevin Johnson
PUBLISHER Addison-Wesley
ISBN 0-201-43288-9

www.awl.com/cseng

Internet Email Protocols

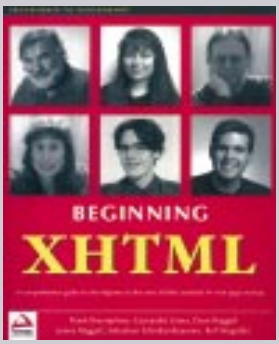
This book is a resource that provides a great deal of information about e-mail: how it is built, exchanged and distributed. It is fairly deeply technical and goes well beyond what a person needs for a brief overview. However, it is crafted in such a way that even a beginner can find necessary information without being burdened with the technicalities.

It opens with a most interesting survey of the physical construction of various types of e-mail message, and proceeds to various protocols including POP, MIME, IMAP and filtering. The chapter on security implications is particularly interesting – especially when it is recognised that the way most people use their e-mail services opens them up to exploitation because they have ignored the many quite thorough tools for providing secrecy, message integrity and operational safety.

Like many technologies, e-mail protocols over the Internet are defined by a series of numbered RFCs (Request For Comment), each a brick in the full edifice – or more often, a piece in the full jigsaw puzzle.

The great value of this book – primarily of interest to developers – is that it gathers together so much information about e-mail in one place, rather than leaving it scattered all over the Net or in books that specialise in only one particular aspect of e-mail.

PCPlus Verdict 8/10



PRICE £28.99
FORMAT Book
AUTHOR Frank Boumphrey et al
PUBLISHER Wrox
ISBN 1-861003-43-9

www.wrox.com

Beginning XHTML

This thick volume is ideal for anybody who has been given the task (or aspires to the task) of building or 'marking up' pages for a Web site. It starts at the beginning, presuming no previous knowledge of the skills exercised, and presuming little in the way of computer knowledge.

The only thing you will need as you start this fast-paced tutorial is a text editor and a Web browser with plenty of excellent examples, illustrations and specifications in each chapter, It is organised into twenty independent divisions, each dealing with a separate subject, such as frames, graphics, style sheets, Javascript and so on.

The wealth of material in the pages of this book is great, and it is well organised so that it can serve not only as a tutorial but also as a good overall reference work. Over sixty pages in seven useful appendices, and an excellent index together end this volume. Continuing support (including free membership in a developer's interest group on the Internet) is provided.

As a tutorial, it must be stressed that you will not find the subject matter packaged into equal sized morsels and accompanying exercises. To study XHTML – the eXtended HyperText Markup Language – from this book will require some investment in time. However, it is thorough and will reward all the time you invest.

PCPlus Verdict 8/10

D-link USB radio

PRICE £35 **EX VAT** £22
SUPPLIER D-link
PHONE 0208 235 5555
ONLINE www.dlink.co.uk

Computer-related work can get boring if you are surrounded by silence, so it's nice to have a bit of background noise. Following the popularity of TV cards, radio is now making a welcome appearance and this radio could be just the thing you need to break up a long day at the office.

The D-link DU-R100 USB radio simply plugs into your sound card. After you've loaded the tuner software, you can listen to your favourite station. The reception is very clear and you can get most of the stations, provided they're located on the FM waveband. It won't be much use if you're a footie fan, though...

PCPlus Verdict 6/10

Lindy Chromo mouse

PRICE £35 **EX VAT** £29
SUPPLIER Lindy UK
PHONE 01642 754 000
ONLINE www.lindy.co.uk

This stylish little rodent comes from Lindy. The company, known for its computer cabling, does a nice range of mice. This model is the latest addition.

This three-buttoned, chromo mouse comes with either a USB or serial-type connector. Although it is smaller than average, it's still a lot bigger than the tiny Teac baby mouse that we reviewed in issue 165.

A neat feature is that it can be used in either hand but there's no thumbwheel available. Maybe it would spoil the neat looks. We wonder if the designers have thought carefully about the fact that the mouse is used everyday. How long will that silver plastic coating last?

PCPlus Verdict 7/10

Creative Webcam Go

PRICE £119 **EX VAT** £101
SUPPLIER Creative
ONLINE www.europe.creative.com

Creative Labs, the company famous for its sound cards, does a popular range of Webcams. The Webcam Go is the latest, and is a digicam with a difference.

It's a bit bigger than usual, with an LCD display on the back, a USB connection and a maximum resolution of VGA – that is, 640x480. In this mode, the camera can handle 16.7 million colours and stream live video at the rate of 15 frames per second. As you can see, these figures aren't too different to usual Webcams on the market.

The camera's main selling point is that it is detachable from your PC. There is an optical viewfinder at the back and the camera will let you store approximately 150 images at 320x240 or 90 at 640x480, thanks to the camera's built-in 4MB memory. The picture quality is reasonable, so it could be worth considering if you want a cheap way to try digital photography.

PCPlus Verdict 8/10

Absolute Multimedia MP3 Player and Writer

PRICE £80 **EX VAT** £68
SUPPLIER Absolute Multimedia
PHONE 01635 278 587
ONLINE www.absolutemm.com

'MP3' is probably the biggest topic in music today and Absolute Multimedia's MP3 player must be one of the smallest around. It's powered by a single AA battery and measures 63x60x19mm. It's barely bigger than a matchbox and yet the sound quality is good. There are no moving parts, so it won't skip or jump like tape and CD-based personal stereos

To transfer songs, you'll need the memory card writer, which plugs into your PC's printer port. Songs can then be transferred to the supplied 16MB CompactFlash card. This MP3 unit is easy-to-use and it's one of the cheapest on the market. Although there's no LCD, it's still worth considering.

PCPlus Verdict 8/10

→ Remotepoint remote control

PRICE £194 **EX VAT** £165 **SUPPLIER** EmphaTek
PHONE 01258 840 939

Tested on HP Vectra VE, 64MB RAM, 4GB hard drive, Win98 SE

Have you ever been to one of those meetings where the person giving the presentation uses one of those clever presentation programs like Microsoft's PowerPoint? Ever wondered how the presenter seamlessly changes the slides without the aid of an assistant or touching the computer's keyboard? Well, they probably have a device like Interlink's Remotepoint remote control unit.

It uses infra-red signals to talk to your computer and it has special slide up and slide down buttons so you can breeze through that accounts presentation. It has a laser so you can highlight items on screen and, thanks to hide and reveal buttons, you can surprise and delight your audience. What's more, this remote control also doubles as a mouse, thanks to a clever thumbwheel.

All of these functions are achieved via a handy remote control device and the signal receiver unit that has both serial and USB connectors.

The Remotepoint remote control is comfortable to hold and comes with a decent manual and two AA batteries, making it easy to recommend if you often make presentations.

PCPlus Verdict 8/10

Chase Swift Synchro universal smart card reader

PRICE £60 **EX VAT** £51 **SUPPLIER** Chase
PHONE 01274 225 000 **ONLINE** www.chase-at.com

Memory cards are everywhere now, thanks to the rise in sales of PDAs, digital cameras and MP3 players.

Often these cards use slow parallel and serial-based connections, and you have to hook them up to your PC before you can download or transfer information. A good way around this is to buy a smartcard reader, but most of these devices can only read CompactFlash or SmartMedia type cards, not both.

The Swift Synchro from Chase is about to change this rule.

It doesn't look like much – it's about the size of a personal stereo. At the front you'll find two slots, one for SmartMedia-type cards and the other a standard PCMCIA-type slot.

By using this PCMCIA-type slot, you can read many different storage types such as IBM's Microdrive and Sony's Memory Stick. All you need is the correct PCMCIA adaptor. We tried this on our PC with a SmartMedia card and an IBM Microdrive and both were recognised straight away as extra drives in My Computer.

Transferring files is fast, thanks to the USB connection and you also get a CompactFlash Type I adaptor thrown in for free. Highly recommended.

PCPlus Verdict 9/10

Labtec Edge 418 speakers

PRICE £80 **EX VAT** £68 **SUPPLIER** Labtec
PHONE 01256 386 000 **ONLINE** www.labtec.com

Everything seems to be getting thinner these days – supermodels, our hair, even monitors. The trend in speaker design is going the same way, too. Not long ago we tested Guillemot flat speakers, now we have a new set of flat panel speakers from Labtec.

Anyone who knows anything about PC audio knows that Labtec is one of the leading lights in the speaker industry so when it produces some new speakers, the industry takes notice. The Labtec Edge 418 comes as a three-piece set with a massive black cube that acts as a subwoofer.

The controls are rather basic: there is a power button and a rotary bass knob, and that's your lot. The sound generated by the satellite flat speakers is good, and certainly up to Labtec's usual high standards. What's more, these speakers are not that expensive for a branded three-piece set. Certainly worth a try.

PCPlus Verdict 9/10

A powerful corporate server with good looks to boot.

The Web administration interface is extremely easy-to-use.

WEB SERVER

Cobalt RaQ 3i

PRICES FROM £2,303 **EX VAT** £1,960 **PHONE** 0208 286 5200
ONLINE cobalt.com **MANUFACTURER** Colbalt UK

The new RaQ 3i from Cobalt is thin, cobalt and thoroughly enjoyable to use

The words 'Web server' are almost always followed by words that lack enthusiasm, unless one is being described by an over-zealous reviewer! Until now, that is. Cobalt has come along and made everything, well, cobalt. Instead of dull gunmetal grey or even the slightly more exciting sgi approaches, the Cobalt RaQ 3i follows on from the ubiquitous Qube in creating a product that not only performs well, but looks groovy.

While good looks are far from a pre-requisite when it comes to buying a Web server, it certainly helps when you show the boss/client where the Web site is held. That said, performance, scalability and manageability are the buzz words when choosing a server and, coincidentally, the key strengths of the RaQ 3i.

The box has two Fast Ethernet ports for connection to routers, hub bridges and switches. This gives it the ability to simultaneously deliver content to a combination of networks, both internal and external. The 300MHz x86 compatible superscalar processor may not seem particularly beefy, but the RaQ 3i is designed for Web serving where processor power is secondary to memory size and management. A maximum of 512MB of PC100 SDRAM DIMMs provides scalability for a site to grow from the standard 64MB RAM.

The machine can hold up to two Ultra ATA hard drives, but there is no internal support for SCSI, a much faster and more reliable disk access method that is better suited to servers. You can, however, plug in an external storage box using the Ultra-Wide SCSI interface, along with a UPS.

Initial set up is achieved through the LCD console on the box and involves little more than assigning the machine an IP address (and gateway if required) and then further configuration can be done through the Web interface from any machine on the network. This feature alone makes it ideal for remote administration, so the machine can be located anywhere with full manageability remaining intact.

The RaQ 3i, like many of its competitors, runs on Linux, with version 2.2 of the kernel being used. The machine also has Apache 1.3.6 Web server pre-loaded and ready to run, which is a common theme of the Cobalt.

How to choose a server

It's an important decision, so make sure you get it right

Choosing a server is tough at the best of times, but the Web is making things increasingly confusing. Traditionally, a server is the big box in the corner that makes an inordinate amount of noise that doesn't seem to do anything until it goes down.

What are your needs?

Your choice will be dictated by your needs (for a change!), so you need to examine what the use of the server will be and by what type of users. You also need to think about how important the information contained on the server will be – is it business critical? If so, you'll need to think about at least hot-pluggable hard drives and RAID; if not, a cluster of servers to provide redundancy.

For a Web server or business-critical Intranet server, it's important to provide redundancy, which is provided better through more than one server than facilities like hot-pluggable drives.

The importance of features such as hot pluggable drives shouldn't be discounted, though, and because one of the primary causes of failure, a RAID array of hot-plug drives can be useful. By mirroring drives, you can simply unplug a faulty drive and replace it. If it goes down out of work hours, the machine will simply move over to the mirror drive as the primary.

Protect yourself

Other crucial factors to consider include UPS (Uninterruptible Power Supply) provision. A cluster of servers is all fine and well until you get a power cut and they all die. If you at least provide an hour or two of protection, then you give time for problems to be fixed. You will also then protect yourself from power spikes and unreliable power delivery.

It really does come with everything you need for a Web/E-commerce/Intranet server ready to run out of the box, which is a nice change if you're used to configuring servers!

Designed for its purpose

In the context of the overall market, the RaQ 3i is a highly innovative product geared to a particular niche of the Web server market. As a pure hardware platform, the Cobalt seems under specified alongside a Compaq DL360 or Dell PowerEdge 2450 but when using the box, the 'design for purpose' of the machine really hits home. It's as powerful as it needs to be, and if you need more power, simply add another server and start clustering. As your needs grow, simply plug in more servers!

The RaQ 3i supports DNS, so it can easily be a DNS server for an internal network. In fact, a RaQ 3i can drastically cut internal computing costs by utilising Intranet technology and Web applications to streamline business processes and create a thin client computing environment. A server like the RaQ 3i, along with the next generation desktop devices that are appearing (such as Compaq's iPaq), can provide a low TCO system, while retaining high functionality.

The Web server marketplace is moving rapidly towards thin, clustered server environments where a number of servers process the information, provide incredible levels of availability and offer a high level of redundancy.

Redundancy is vital on the Web. If you only have one server and something goes wrong, the dreaded 'server not found' message starts appearing in browsers – bad news for customers. If there's a second or third waiting to take the strain, the faulty machine can safely be unplugged and repaired.

In many ways, a Cobalt RaQ server is designed for a hosting company or ISP because its interface is geared towards enabling a number of users to access their Web sites and upload or download information. While the number of applications of such a design is almost limitless in this Internet-driven world, some smaller organisations may not immediately see the value of letting a number of people run Web sites from your server.

Take an example

An imaginary small organisation, employing about 40 staff in a single office, decides that it needs to use the Internet to talk to its customers better, but also feels that sharing information internally is something that is important and currently isn't being achieved.

While the company needs some Web skills to build sites and services, the Cobalt RaQ 3i is a perfect device to sit on top of the existing IT infrastructure to drive Internet and Intranet sites. It can be connected to the network, with one or more people given Intranet publishing privileges and site maintenance responsibility for their department's Intranet site and a 'Webmaster' that is given further Web publishing privileges.

This machine is a great solution for those that need all the features of Cobalt's Qube: easy management, simple set up and configuration, reliability, and an element of scalability. Plus it looks cool to boot!

Peter Guthrie

PCPlus Verdict

COBALT RAQ 3I

☑FOR	☒AGAINST
→ Small form factor	→ Not a great deal
→ Very easy management,	
→Good performance	

Specification	9
Quality	9
Performance	8
Value for money	9
OVERALL	**9**

→Hosting remotely

The pros and cons of outsourcing your server

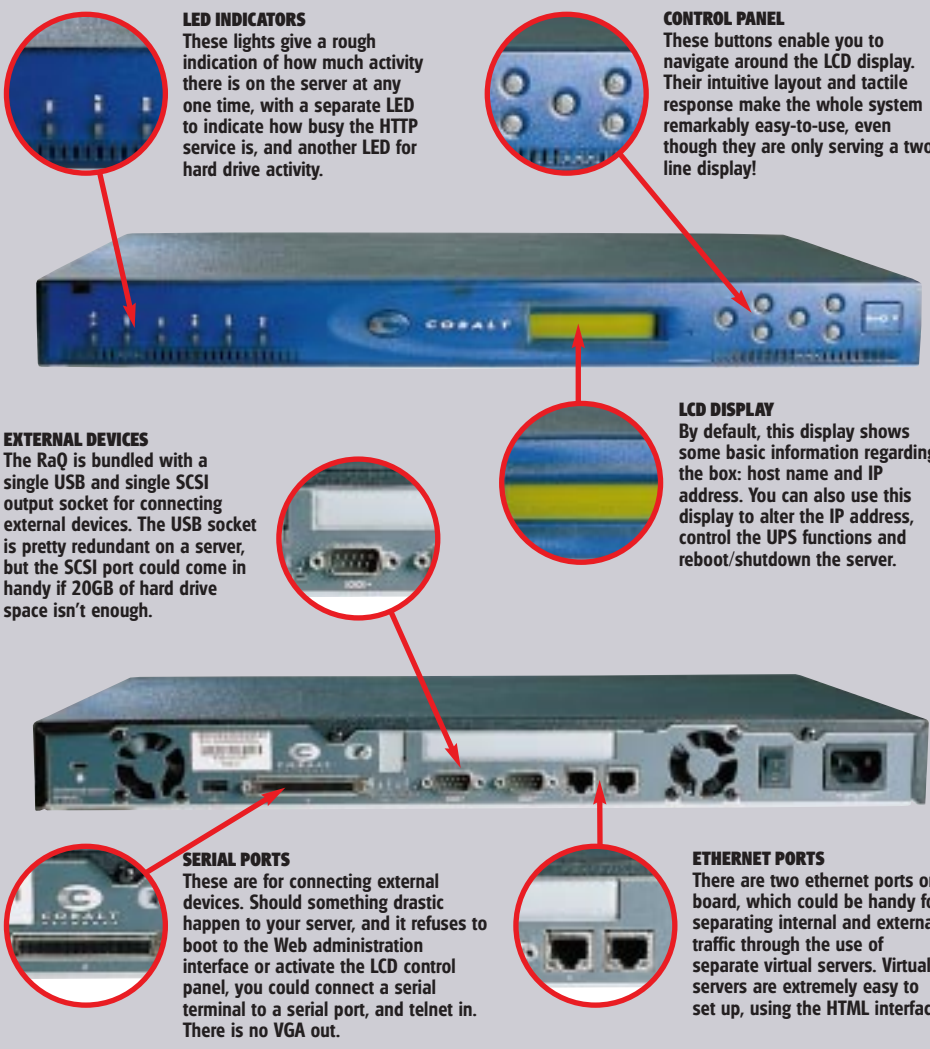
Probably the most popular way to run a Web site is to choose an external host. You have a share of a much larger 'pipe' (pipe = data cable – ISDN is a thin pipe at 128kbps and T1 is starting to get a little fatter at about 1.5Mbps) than you could afford by yourself and, therefore, the capacity to deal with a high 'burst rate' of users. There's also the factor that, if a server goes down, there's someone to shout very loudly and stamp your feet at!

While it's easier to run your site remotely, it can be a little expensive. There are, finally, some cheaper options coming on the market. The advent of ADSL and cable modems means that a 512kbps 'permanent' connection is available from a mere £40 a month – a fraction of the cost of a 64kbps leased line. While it's entirely practical to run a small Web site over such a line, it's far from recommended if you're expecting some serious traffic.

While you are offered a 'permanent' connection, that's not actually what you're getting because the lines will disconnect when inactive (like some of the bandwidth saving bits of ISDN) and take nearly a second to come back online. While waiting a second for a page to load is fine, that second is on top of the time it takes the Internet and your ISP to route the client browser through to you – and that extra time could be costly.

→Features on the RaQ 3i

A closer look at six of the most important features...



WEB PROGRAMMING

ColdFusion Studio 4.5

PRICE £422 **EX VAT** £359 **SUPPLIER** Unipalm **PHONE** 01638 569600 **ONLINE** www.allaire.com

ColdFusion has become almost the 'industry standard' for creating Web applications, and the latest incarnation looks to leave the competition standing

Talk to anyone involved with the Web right now and they'll tell you that interactivity is the key to gaining and retaining users. Organisations are slowly realising that online brochures aren't enough to really make money from the Web and interacting with customers is the direction in which the world is heading. So how do you go about creating interactivity when all you know is some basic HTML?

Fortunately, Allaire is about ten steps ahead of you with a product with a relatively shallow learning curve (for a programming language!) and simply extending the tag-based approach of HTML to a more expansive instruction set. The big thing that you need to understand is databases. Interactive sites mean dynamically generated pages, which, in turn, mean databases, so an understanding of relational databases is fundamental to building Web applications.

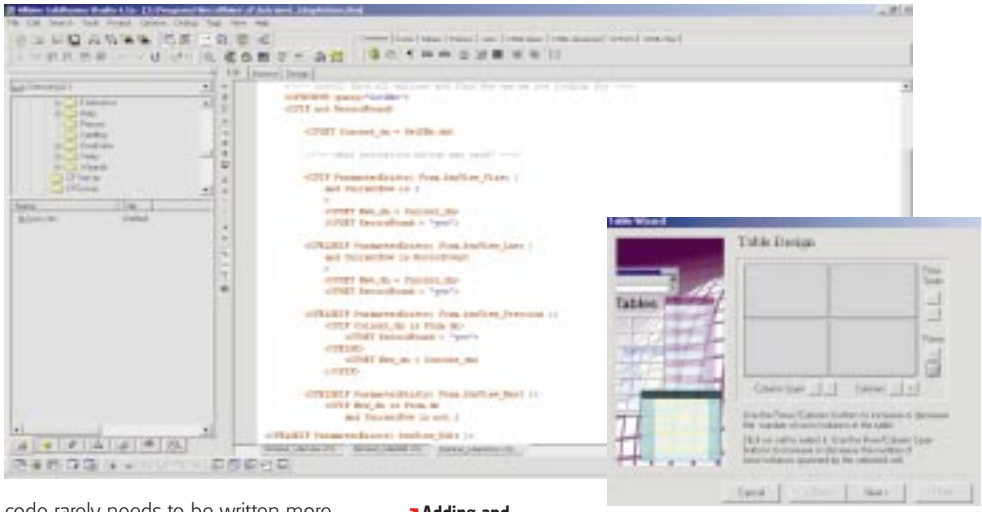
It's also not too expensive and is easily scalable to suit the budget and needs of a growing enterprise. The Studio Product, which retails at a mere £340 also comes with a single user version of the Standard Edition Server Product, which can be used to pilot a product before publishing to the Web.

→Coding in CFML and HTML is fast and pleasant in the coding environment and some excellent debuggers are there if you're new to either language.

The overall package is big. Unlike many such packages, there's a wealth of documentation and a good manual on the language you'll have to learn, ColdFusion Markup Language (CFML). In all, the Studio and Enterprise Server products that we reviewed came with no fewer than four thick manuals and more reading materials besides. The full range consists of the Studio product which retails at £469, and two server products: Professional at £1,115 and Enterprise at £2,565.

Version 4.0 of ColdFusion faced stiff competition from Macromedia Drumbeat 2000, which offered Web applications without all the fuss of coding. Macromedia provides visual tools that generally require little or no coding with the donkey work done by the package itself. While Allaire takes a fundamentally different approach to designing its software, the company may well be trembling a little at the potential of Macromedia's Dreamweaver UltraDev – all the code free bliss of Drumbeat, but within the Dreamweaver interface. We've looked at a beta version and it's terrific if you're not a techie (and more importantly have no intention of being one!), but ColdFusion gives you more control over what you produce.

At the end of the day, a package in which you code yourself will ensure that code produced does the job it was intended for and greatly adds to the flexibility of the package itself. If you're not a coder, then you'll soon find out that code rarely needs to be written more than once and, as soon as you've written a couple of applications, you'll simply rip off any code you've written!



↗Adding and manipulating tables for templates or static pages is easy and very reminiscent of HomePage.

ColdFusion is a more technical solution, but you are likely to generate a better solution in the long term. A piece of software like ColdFusion makes you think about your application and the problem you are trying to solve with it before designing it. This way you can ensure that the solution is right for the problem and that the quality of the final product is good.

For experienced coders, ColdFusion will stir two emotions – firstly that you've finally found a programming environment that is truly intuitive and second that it's all terribly easy! That said, for some it may be a little light and if you need some real high-end power then you may need to look at more technical packages such as WebSphere from IBM, HAHTSite from HAHT Software. All work in pretty much the same way.

There are lots of new wizards to help you perform day-to-day tasks and build the most common Web applications. There is a tutorial that helps you through most of the basic functions, though it's somewhat disheartening as it looks awful. The scripting environment has been significantly enhanced and become far more visual in its approach to development. Many tags within CFML now have buttons for deployment, no doubt because of the growing problems of RSI in the developer community!

Conclusion

Just about every aspect of ColdFusion has improved. There are more code wizards for beginners and more power tools for the experts. The server is faster and easier to use and the package supports most of the new technologies that have emerged since 4.0, there is even WML support.

You can go into ColdFusion with little or no experience of programming and come out a fully-fledged coder, you just have to remember that it isn't as difficult as you think. With a little experience, you can really achieve a lot with ColdFusion, but if you're new to Web applications or the whole world of 'techiedom', try doing some Allaire training with a company like www.highlander.co.uk Highlander (0208 316 5001) and you'll become a true techie.

Peter Guthrie

Requirements
P233, 64MB RAM, 200MB hard disk space Win95/98/NT/2000, Linux

Tested on
Athlon 750, 384MB RAM, Win2000 Advanced Server, Microsoft IIS 5.0

Extra information
Professional Server £1,115 (£949 ex VAT)
Enterprise Server £4224 (£3595 ex VAT)

PCPlus Verdict

COLDFUSION 4.5

✓FOR
- → Easy to learn language
- → Scalability wizards

✗AGAINST
- → Can be confusing to beginners
- → Naff looking tutorial

Specifications	9
Quality	9
Value for money	9
Performance	8
OVERALL	**9**

GAMES DEVELOPMENT SUITE

DIV Games Studio

PRICE £35 **EX VAT** £30 **SUPPLIER** FastTrak Software **PHONE** 01923 495496
ONLINE www.div-arena.com **PUBLISHER** www.fasttrak.co.uk

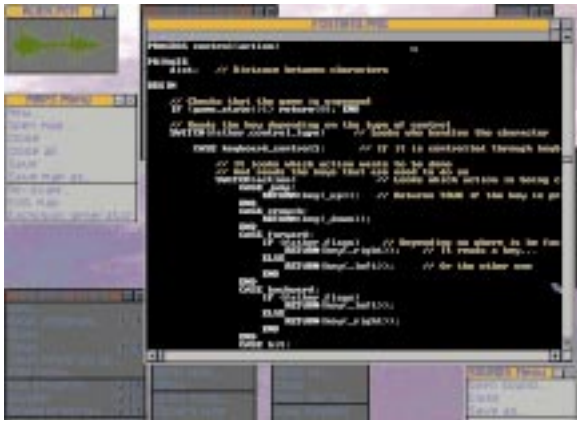
There's a good game in every person, just waiting to get out. DivGames can set it free

If you think software for creating video games sounds like child's play, think again! The DIV Games Studio is a complete development environment which provides an integrated set of graphics and sound manipulation tools plus a dedicated programming language and debugger.

A set of 16 sample programs ranging from a Mario-style 'platform' game to a Quake-style shoot-and-beat-'em up, demonstrates the power and speed of this system. Whether you want to write programs for your own pleasure or have ambitions to create commercial quality software, DIV Games Studio is one of the simplest and least expensive routes into games programming.

The program includes everything from an explosion-effect generator to a setup utility for creating installation disks for your game. It also has a moderately effective graphics editor for painting backgrounds and drawing characters. While this editor is adequate for simple graphics, it does not rival the capabilities of dedicated 3D graphics programs. It does let you import graphics created by other applications, however.

At the heart of the system is the programming editor. This is a syntax-sensitive editor which automatically colours code and comments as they are written. You can get help on built-in functions by highlighting a piece of code and pressing the [F1] key. An integrated debugger lets you trace through your code and inspect or alter the values of variables. When you are ready to try out your program, you can press a function key to execute your code.



↑**DIV Games Studio provides an integrated development environment which includes a syntax colour-coded program editor.**

REQUIREMENTS
486, 8Mb RAM, DOS, Windows 95/98

TESTED ON
Pentium II 350MHz, 128Mb RAM, Windows 98

While DIV Games Studio makes light work of games programming, we have to say that we feel that FastTrak is being somewhat economical with the truth in its claim that it "requires no previous knowledge of programming." In our opinion, its programming language is quite complicated. With a syntax that that resembles both Pascal (with its BEGIN... END blocks) and C (with its += assignment and increment operators) it can hardly be regarded as ideal for a total beginner.

Before you can to do any coding at all you will need, at the very least, a familiarity with basic concepts such as variables, loops, operator precedence and scoping. In order to do more advanced coding, it would also be useful to understand the fundamentals of screen handling, user-defined structures and concurrently running processes.

If you are serious about games development, you may be wondering what royalty payments you will have to make when distributing your games. The answer is none at all. FastTrak software doesn't require that you give any credit whatsoever to DIV Games Studio. So, as far as the player knows, your game could have been hand-crafted in machine code!

There are a few irritations about this software. For example, once loaded, it takes over the Windows workplace so you can't switch to other running applications until you quit the program.

←**Combat games can be coded fairly easily but you'll need a 3D graphics package for designing characters.**

We also found problems with the sound. While the software claims to be fully compatible with SoundBlaster cards, it did not produce sounds with our SoundBlaster PCI64V.

Even though it can be executed from within Windows, DIV is a DOS-based program. This is bad news if you want to produce fully Windows-hosted games that take advantage of technologies such as DirectX. For developing Windows games you should consider competing software such as DarkBasic.

www.darkbasic.com

Overall, DIV Games Studio is a remarkably powerful and sophisticated games development suite at the price. It comes with a reasonably good 280 page manual comprising a tutorial and a programming reference. There is also an active discussion group and code repository on the DIV Web site.

For experienced programmers who want to create video games, DIV Games Studio is a good choice. It's also a fun way for less advanced programmers to develop their programming skills. Its main disadvantage is that it is essentially a DOS application rather than a native Windows program. And if you believe the claim that no programming experience is necessary, you'll be sorely disappointed!

Huw Collingbourne

PCPlus Verdict

DIV GAMES STUDIO

✓FOR
- → Good value
- → Good fun
- → Powerful programming language

✗AGAINST
- → Not really for non-programmers
- → DOS-based

Specification	7
Quality	7
Performance	5
Value for money	9
OVERALL	**8**

FREE NET ACCESS

How free, is free?

Free ISPs, unmetered access... the options for getting online for less have never been greater. But how much money are you really saving? Mike Williams discovers how one free ISP could offer a better deal than another

Do you remember what Internet access was like a couple of years ago? Virtually everyone paid a monthly subscription to their ISP for the privilege of going online, which cost anything up to £15. That didn't include the cost of the telephone calls, either, which might explain why most people saw the Internet as an expensive luxury. And, then, in September 1998, Freeserve was launched and everything changed. Other companies, X-Stream, for example, provided subscription-free access before, but none had as much money behind them as Freeserve, and with disks available at Dixons and PC World stores across the country, they were sure to be a big success.

Not that everyone saw it that way, though. 'It'll never last', was a common viewpoint – 'they'll either go bust, or be charging for access within six months'. Neither option came true, of course, and Freeserve became the biggest ISP in the country.

Even more importantly, other companies realised that a free ISP could be financially viable and decided to join the party. Suddenly, free ISPs were everywhere and Internet access became a basic commodity. It couldn't get any better than this. Could it?

What does 'free' mean?

As their telephone bills arrived, people gradually began to realise that perhaps their Internet access wasn't quite so 'free', after all. Could any ISP offer free telephone access, too? It seemed unlikely, as most of them were funded by taking a proportion of the revenue raised from each phone call, but eventually someone tried.

Screaming.net promised free weekend and off-peak telephone access, as long as you switched your telephone service provider to their partner, Localtel. An alternative source of funding? In principle it seemed a

good idea but proved to be a public relations disaster. CDs used to sign up to the service disappeared from of the shops within days, and Screaming.net was completely overwhelmed. Potential subscribers found it took ages to transfer their telephone account to Localtel, and once they had signed up, reported the service was so busy it was almost impossible to connect.

Unmetered access has come a long way since then, but the basic pattern remains disturbingly familiar: company makes offer, is slow to sign people up, reports that they 'didn't expect this level of response', users find the service is slow, and the company says it's their own fault for going online so much.

Maybe things will change in six months, but right now it seems clear that going for an unmetered ISP is a risk. You're handing over perhaps £50 to sign up, usually to a company that doesn't promise you any level of service at all (check their terms and conditions carefully to see what we mean). A good deal? We think not, but that's okay – there is a better solution.

Subscription-free ISPs

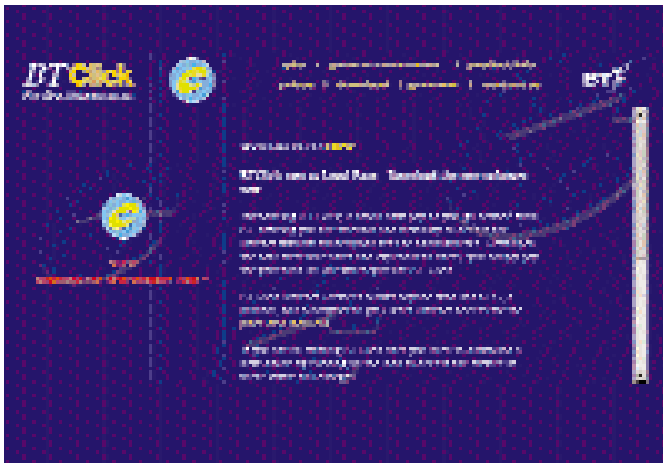
While we wait for the picture on unmetered ISPs to become a little clearer, the best decision is to get yourself a simple subscription-free ISP instead. That is, you pay for local call access only.

You've got an ISP account already? Well, there's no harm in having a backup for those times when your regular ISP isn't performing as it should. What's more, are you sure your ISP is offering you the best service you can get? Even if you're paying for Internet access, you might find a free ISP that offers you more features.

Of course, we all expect different things from an ISP, so we considered several different factors reviewing them. This started with the online signup process – were the instructions easy to follow? Did the ISP try to automate things for you? Believe it or not, some ISPs make such a mess of this that it's difficult to open an account.

Once connected, we took a look at the content on the ISP's Web page. We gave some credit for useful or entertaining stuff that you couldn't find elsewhere, and a whole lot if they provided useable online help and even more if the telephone support was cheap. After this, there were some simple performance tests based on average throughput, and we were interested in any other bonus features the ISP might have to offer, Web space features in particular.

The only difficulty with this approach is that no matter how we weight each feature, you might feel differently. Perhaps you're an Internet expert and don't care at all about online help. Or maybe you're interested in a second account for the Web space, and nothing else really matters. Whatever your situation, we recommend you take the overall marks just as a general guide. Many ISPs excel in some areas and are poor at others, so make sure you consider the full review before you make a decision.



↑No frills but all the better for it.

www.btcclick.co.uk

BT Click

No signing up, no complex installation, no extras – just Internet access, pure and simple

"**What's** the catch?" That's one of the most common questions asked about free ISPs, and while most will tell you there IS no catch, that's not quite true. If nothing else, they'll do their best to make sure you see as much of their advertising as possible; they have to fund their service somehow, after all.

The good news, however, is that BT Click is just about as simple an ISP to use as it's possible to get. Instead of filling in your personal details in a lengthy form, you just download a tiny piece of software (at just 89KB, it downloads to your PC in a few seconds).

Run the program, and it automatically creates a Dial-up Networking connection to BT Click, and puts an icon on your desktop to launch it.

Now, whenever you want to access the Internet, just double-click on the 'BT Click' icon – that's it. There's no password to enter because you don't need one. And there's nothing more to pay beyond the local rate phone call (select it as a BT Friends and Family number to cut your costs further still).

The downside

The flip side of this simplicity is the complete absence of any features at all.

There's no mail. No Web space. No content. No news server. Almost nothing at all. We were momentarily excited by a 'Fun' section on the BT Click page, which promised: "this section is where we'll be adding some fun downloadables and games to the site"... But all it contained was a BT Click promotional screen saver. This seemed a little harsh.

The sparse nature of BT Click makes it completely unsuitable for use as your main ISP, but that's not really what it's all about.

The ease of installation makes it absolutely perfect as a backup, for those times when your own ISP is having technical troubles and you can't get online. And there's no need to worry about BT Click cancelling your account if you've not accessed it for a while, because in effect you have no account to cancel.

It does seems strange to be recommending a service which offers next to no extras at all, but that's not the way to think about it.

Simple, portable, and it won't mess up your existing settings – what more do you want from a second-string form of Internet access? With BT Click, there really is no catch.

PCPlus Verdict

BT CLICK

☑ FOR	☒ AGAINST
→ Excellent installation program	→ No frills at all
→ Simple service	

Ease of online signup	10
Online help	4
Features	2
Performance	5
OVERALL	**6**

↑An interesting ISP but hugely expensive technical support.

www.contactbox.co.uk

Contact Box

A better than average ISP with lots of bonus features, but not really aimed at beginners

Here's a question: how does a free ISP fund itself? Most manage by a combination of taking advertising, and taking a cut of the cost of your telephone calls, but the fact that even Freeserve is managing to make a loss suggests there needs to be other ways.

A novel approach

Contact Box takes a different approach to the problem, designed to get you, and others, to use its phone lines for more than just Internet traffic.

On signup you are given a free personal telephone number you can give out to other people, which you can redirect to other numbers so that phone calls follow you around. The same number offers free voice mail and it enables people to send you faxes, too, which are redirected to your e-mail.

This is an impressive package and seemed to work well enough when we tried it, though you shouldn't bother taking it out on a whim. You have to receive at least 5 minutes of calls a month on your 070 number, or Contact Box takes it back (which is fair enough – you're not paying for it, after all).

And if you're not interested in the messaging facilities? The Internet access side is reasonable, too, though you must negotiate the installation process first. A lack of detailed instructions part way through guarantee some people will get confused. Speed is good. You can have unlimited POP3 addresses, and a sizeable 25MB of disk space should be more than enough for most people.

The only real disappointment was the Contact Box site itself which, unlike the rest of the service, is an unprofessional mess.

The online help gains a few points for covering MacOS and Amiga OS as well as Windows, but then loses them all because the content is so sparse.

And other features like the 'TV Listings' and the portal seem to consist entirely of links to resources on other sites, which in many cases were broken and didn't work at all. Oh dear.

Overall, Contact Box is an interesting ISP with lots of good features, seemingly aimed at the business or the home office user. If you're an Internet beginner, the poor registration instructions, lack of online help and expensive support – £1 per minute, 9am to 5pm at the weekend and only 12pm – 4pm at the weekend – will hit you hard, and we'd advise you look elsewhere.

PCPlus Verdict

CONTACT BOX

☑ FOR	☒ AGAINST
→ Speed	→ Appalling home page
→ Messaging features	→ Weak online help
→ Lots of disk space	→ Expensive phone support

Ease of online signup	5
Online help	5
Features	10
Performance	9
OVERALL	**7**

↑Strong features with decent all-round performance.

www.free4all.co.uk

Free4All

With lots of e-mail options and powerful Web page features, Free4All should satisfy even the expert user

Free4All is run by the same people behind the unmetered ISP RedHotAnt. If you read any of the UK ISP-related newsgroups, or visit Web sites like Net4Nowt or ISPReview this might trouble you, because RedHotAnt has been the subject of lots of angry complaints for quite some time, culminating in an investigation by Trading Standards Officers.

www.ispreview.co.uk

In fairness, though, there are plenty of complaints about most of the unmetered ISPs, which is why we're recommending you use a local rate ISP for the moment. And remember, there is no risk in trying out an ISP like Free4All; if you don't like it, use something else, it's as easy as that.

The first unusual feature you might notice with Free4All is that there's no automatic installation available, so you have to configure Dial-Up Networking, and any mail or news software you use, on your own.

Fortunately the online help is very good, covering a good range of operating systems – Mac OS, AMIGA OS, Acorn Risc OS and Linux, as well as Windows 95, 98 or NT. You get advice on setting up Netscape Messenger and Eudora Lite for e-mail, as well as Outlook Express, and a guide to CuteFTP will help you use that program to upload your Web page.

It occasionally took us a while to connect to the Internet (we had to redial a few times on several occasions), but when we did, the performance was reasonable.

The real strength of Free4All lies in the extra features it provides, especially with the Web space, where you can use both SSI (Server Side Includes) and CGI (Common Gateway Interface) scripts to help add all kinds of useful interactive features to your Web site.

A Free4All account comes with some handy e-mail features, too, like junk mail filters to remove unwanted messages, and mail forwarding (sending all your e-mail to another address). You can also configure an autoresponder so incoming messages get a standard reply – useful if you're away on holiday, say, and can't reply immediately yourself.

And we still haven't mentioned the multiplayer games server, the free e-mail to fax service or the local-rate telephone support. We're unsure whether the RedHotAnt problems will affect performance at Free4All, but it has got so many features, we have to recommend you give it a try.

PCPlus Verdict

FREE4ALL

✓FOR	✗ AGAINST
→ Online help	→ No automatic configuration of your system during setup
→ Strong Web space features	
→ E-mail forwarding	

Ease of online signup	6
Online help	9
Features	10
Performance	7
OVERALL	**9**

↑Free access comes with 70,000 newsgroups – impressive.

www.free-online.net

FreeOnline

Are you still paying for Internet access? Take a look at what FreeOnline gives you for nothing

What makes a good ISP? Some companies go for one or two killer features, but FreeOnline take a different tack. It seems that its looked at everything the typical user requires, and tried to go just a little bit further than the competition.

Attention to detail

We first noticed this attention to detail as we signed up for an account, oddly enough. Registering a new ISP is normally a dull experience indeed (enter name, address, telephone number maybe, e-mail address, yawn...), but FreeOnline actually did something to help; type in your postcode, press a button, and most of your address is filled in automatically. Clever!

The final part of the installation process is equally well thought out. Internet Explorer users can simply click on a button to reconfigure the program with the FreeOnline settings, but if you're using another browser (or just prefer to set things up yourself) the site can display all the information you need to do things manually.

Once you're connected, many of the other FreeOnline advantages become quickly apparent. One of the most impressive is the news server, which carries an amazing 70,000 or more newsgroups (many servers barely reach 30,000).

The online help is great, too, providing setup information for many more applications than just the usual Internet Explorer and Outlook Express. The mail instructions cover two different versions of Netscape mail software, for example, along with Pegasus Mail, Outlook, Eudora Light and Eudora Pro.

But if it doesn't answer your questions, there's no need to worry; technical support is available by telephone at national rates, 24 hours a day and 7 days a week (you could pay for an ISP and not get that level of service).

Even its portal is better than most ISPs manage, providing the latest news stories, along with a few handy tools like an online address book, and an easy way to submit your FreeOnline Web site to five major search engines. That's the site for which you have unlimited Web space – FreeOnline don't like to be beaten by anyone!

We tried to think of reasons not to subscribe to FreeOnline. And we failed. With more features than some subscription ISPs, FreeOnline is one of the best bargains around at the moment. We say, snap it up right now!

PCPlus Verdict

FREEONLINE

✓FOR	✗ AGAINST
→ Easy installation	→ Nothing
→ Newsgroup-packed	
→ Good support	
→ Unlimited Web space	

Ease of online signup	8
Online help	9
Features	9
Performance	8
OVERALL	**9**

↑Having problems in the City these days but still a worthy ISP.

↑Want Net access with your baked beans? Now you can.

www.freeserve.net

Freeserve

Only basic Internet features, but lots of extras and excellent content

How did Freeserve get to be the number one ISP? Being the first to offer a subscription-free service helped a lot, but there's more to it than that. After all, why should anyone stay loyal to a free ISP, when it's so easy to move to a new one?

You won't find the reason for Freeserve's success by looking at the usual ISP feature tables. They reveal a fairly standard set of options, with the usual unlimited e-mail addresses, a small-ish 15MB of disk space, and technical support at a typical 50p per minute.

Visit **www.freeserve.com**, though, and things start to make more sense. There's vast amounts of attractively-presented content to wade through, and while some of it is provided by other sites – music news comes courtesy of, for example Music365, at least it's well

www.music365.co.uk

integrated, without the mistakes and broken links offered by some of the competition.

Personal probing

The professional feel carries on during the signup process, although we did have a minor complaint; Freeserve asks for vastly more personal information than any of the other ISPs we used in this Lab test.

You don't actually have to answer all its questions, but that's not explicit, and we imagine most people will simply work their way down the list.

Once your account is working and you're online, it's soon obvious why Freeserve is so popular – it gets you just with the sheer weight of extras.

You don't just get e-mail via an e-mail program, for example. You can also be alerted by a pager, collect it via a Web browser, or listen and reply to messages via a telephone (that's any phone, it doesn't have to be a WAP mobile). And Freeserve is trialling a free Inbox service, offering a Contact Box-like phone number for voice mail and faxes.

If you're concerned about your phone bill, it has plenty of options with a couple of ways to get at least some unmetered access. Wherever you look, something's going on; Freeserve knows the competition is out there, and it is doing its best to keep existing members, and attract new ones.

Anyone demanding quality Web space features, or top performance, won't be impressed by Freeserve but for the uncommitted family user it remains a very good bet indeed.

PCPlus Verdict

FREESERVE

☑FOR	☒AGAINST
→ Excellent e-mail features	→ Performance only average
→ Quality content	
→ Lots to explore	

Ease of online signup	8
Online help	9
Features	7
Performance	7
OVERALL	**8**

www.tesco.net

TESCOnet

A TESCOnet account isn't exactly feature-packed, but it's user-friendly and great for first-time Internet users

One important ingredient in the success of any free ISP (even subscription ISPs) is to know who its audience is. Who will be using the service? What do these people want? A quick look at the home page of the average ISP shows that most of them have absolutely no idea of the answer to this question.

Visit TESCOnet, though, and you get a different impression – it's an unashamedly family-oriented site. This begins at the excellent portal page, which you can customise to suit your requirements, from topics like Food and Drink, Travel, or Work and Finance. Unlike most portals, it doesn't overwhelm you with information, but is a pleasant and easy-to-use starting point for the beginner.

Easy installation

The installation process is equally gentle and suitable for all, causing us no problems at all, though if you prefer, you can buy an installation CD in a Tesco store for a mere 50p. One point to note is that you must be a member of Tesco's loyalty card scheme, as it requires you to enter your club card number during registration. (The cards are free, though – just get a form from your local Tesco store).

Once you're online, family users might also find the free parental control software CyberSentinal an attractive feature of TESCOnet, though its claim that "you can be assured that your children can log on without the need for supervision" may be a little exaggerated – no Internet censoring software is 100 per cent reliable.

Look at the specifications of the rest of the service, and it's merely sufficient. The Web space available is small at 10MB, but still probably enough for most people. You have only 10 e-mail addresses available, not the unlimited number other ISPs offer – but then, how many do you actually need?

As befits a site basically aimed at the new Internet user, the online help is superb. Not only are there basic articles like 'Creating a Dial-Up Networking Connection', but they bravely go into much deeper waters with 'Modems and port speeds' and 'Windows networking'.

It's all very well put together, but if it still doesn't help, telephone support at a reasonable 50p is available 7 days a week, from 8am to midnight.

There's little here for the power user, but beginners will find TESCOnet a comfortable home.

PCPlus Verdict

TESCONET

☑FOR	☒AGAINST
→ Excellent online help	→ Can't sign up without a Tesco Club Card
→ Good portal	→ Internet features nothing special
→ Free parental control software	

Ease of online signup	7
Online help	10
Features	6
Performance	7
OVERALL	**8**

↑Solid and reliable without being stunning in any department.

↑Not one for beginners but ideal for Linux enthusiasts.

www.ukfantastic.net

UK Fantastic

A solid, reliable free ISP – it might not do too much, but it does do it well

What do you expect from an ISP? While companies like Contact Box race along adding extra features (and failing to notice all the broken links on its own site), UK Fantastic concentrates on the basics.

This starts at the important installation stage. Just fill in a simple form, click on 'Submit', and in a few moments you have an account. Click on another button and Internet Explorer will be configured for you. And if you're using another browser? A page is provided with all the server names you need to configure your Internet software of choice.

Good in action

Using the service was a pleasure, too. We had no problems connecting and performance was excellent. That's probably just as well because the only thing impressive about their online help was its name, the Online Technical Help Centre for Windows. Take a look at it and you find this Help Centre is actually just a single page with a basic explanation of setting up Dial-Up Networking, and a few mail and news-related details.

Screen shots helped make the page worthwhile, but it's hardly likely to help beginners – if they didn't have Dial-Up Networking installed, then they weren't likely to be able to access this site in the first place.

If you do have to resort to telephone support, then the above-average 75p per minute charge is unlikely to improve your mood. On the plus side, though, it's available 24 hours a day, and when we tried the line it was answered quickly, by a knowledgeable support person.

Another benefit of using UK Fantastic is the short and snappy ukf.net domain name. If you're a business user, for example, then you might not want it to be obvious that you're using a free ISP (**mycompany@reallyreally cheapandfree.com** lacks a certain credibility), and **mycompany@ ukf.net** is suitably anonymous. And no matter who you are, if you're going to take advantage of the reasonable 20MB of disk space, a Web address as simple as www.mycompany.ukf.net is a lot better than many of the alternatives.

UK Fantastic isn't a perfect service, and some additional online help would be useful, but in general we liked it a lot. This seems to be a solid and reliable free ISP, suitable for just about everybody.

PCPlus Verdict

UK FANTASTIC

☑FOR	☒AGAINST
→ Performance	→ Insubstantial online help
→ 24-hour phone support	→ Telephone support not cheap
→ Short e-mail and Web address	

Ease of online signup	7
Online help	6
Features	7
Performance	9
OVERALL	**8**

www.uklinux.net

UK Linux

Brilliant for experts, but less useful for beginners. A lot like Linux itself, really

Most people know Linux primarily for the many entertaining arguments it's caused recently. "Linux is a great operating system that will knock Windows of its perch", shout the fans. "It's a user-unfriendly niche product with no applications", claim the detractors, "though we do like the cute penguin".

The 'my operating system is better than yours' arguments tire eventually, of course, so it would be nice to think that UK Linux – the UK's only ISP dedicated to users of Linux and Open Source/Free Software, and the best online Linux resource in the UK – might be able to give people something else to talk about.

UK Linux definitely impresses technically with features like 128 kb/s ISDN access, which beats even many subscription ISPs. They provide unlimited e-mail addresses, too, but the real highlight of the service is the free Web space. The 20MB of disk space isn't excessive, but supports powerful features like Perl to create CGI programs, and PHP (a scripting language that can be embedded in your HTML code, which runs on the server and helps produce dynamic Web pages – something like a Unix version of Microsoft's Active Server Pages).

And if you need more than CGI or scripting capabilities, how about free support for MySQL and PostgreSQL? These provide high-quality, professional database features, which are typically only available from others if you pay to have your Web site hosted somewhere.

You also get htaccess support, which means you can create a secure, password-protected area of your Web site. It's even possible to build a WAP site that can be accessed from the latest generation of mobile phones, again a real rarity unless you're paying for quality Web hosting.

This is definitely the best free Web space package we reviewed, but beware – like Linux itself, UK Linux probably isn't for everyone. There's no telephone help, and very little assistance. Experts can get on and make the most of the Web features, but everyone else will have to learn what they need to know elsewhere. There's no automated setup, either, so you'll need to set up a new Dial-Up Networking connection yourself. Beginners should probably go elsewhere, but more experienced users will find UK Linux a surprisingly powerful ISP, providing good performance.

PCPlus Verdict

UK LINUX

☑FOR	☒AGAINST
→ Outstanding Web space features	→ Minimal help
→ 128 kb/s ISDN access	→ Manual installation process

Ease of online signup	6
Online help	3
Features	10
Performance	7
OVERALL	**8**

↑More Virgin trains than Virgin Atlantic.

↑Once the first, now just the worst, at least in this company.

www.virgin.net

Virgin Net

A friendly Web site and good content, suitable for beginners but no longer a bargain

Virgin Net is one of Britain's great Internet success stories according to a previous review, proudly quoted on its pages. While perhaps this was once true, the fact that this quote was made in July 1998 might suggest that Virgin Net's best days are firmly behind it.

Out of date

The sense of a service that's increasingly out of date continues when you read its answer to the question, "How does Virgin Net differ from other 'free' Internet Service Providers?".

Its list of features includes such things as 5 e-mail addresses and 10Mb of Web space, which is indeed different to most other ISPs, though perhaps not in the direction they think.

Hopes that things might pick up receded when we started the online registration process, which works via a slow Java applet, rather than the more usual basic HTML form. It all appeared to work until the final step, when we were told the registration had failed because of a problem with the registration server. Not good.

After three more failures we called technical support, who told us this might happen if the e-mail address we had chosen was already taken.

Sure enough, changing the name brought instant success. Why couldn't the registration process have explained the e-mail address was taken?

By this time our enthusiasm for the service was waning, but much to our surprise, things started to improve. The speed of our connection was consistently good, and the online help would be appreciated by Internet beginners, even including such things as a basic HTML tutorial.

Telephone support is costly at £1 a minute, but you can choose to pay £5.99 a month, and get local-rate support.

A good deal? It depends how often you're likely to call; now that some free ISPs offer cheap technical support with no subscription at all, you might be better off with one of them.

The real gem with Virgin Net is the quality of the content on its pages, where you'll find all kinds of entertainment-related features, articles, news, competitions and more.

But as you can view it whatever ISP you choose, there's no real incentive to sign up for Virgin Net.

Overall, based on the actual ISP-oriented features, this was a real disappointment.

PCPlus Verdict

VIRGIN NET

✓FOR	✗ AGAINST
→ Speed	→ Few e-mail addresses
→ Entertainment-related content	→ Expensive support
→ Good online help	→ Only 10MB space

Ease of online signup 6
Online help 8
Features 5
Performance 7
OVERALL 6

www.x-stream.co.uk

X-Stream

One of the first to offer a free acces, X-Stream loses its way

In the current fuss over unmetered ISPs, it's often forgotten that X-Stream has been offering 0800 access, at least occasionally, for ages. It was one of the first to offer local-rate access with no subscription fee, too (beating Freeserve), which it funded by requiring you to view an advertising bar on the top of your screen while connected to the Internet.

Ad banners

Sounds inconvenient? Well, the bar doesn't take up too much space (maybe twice the size of the taskbar), but it does complicate installation. Instead of filling in a Web page form, you must download a 1.5MB program, and run that. The software then collects your details, connects to X-Stream, and opens the account for you. In future you must use it to connect, launching the advertising bar at the same time.

There are a reasonable number of features, though we had problems getting some of them to work. Like Contact Box, for example, you're supposed to be able to claim a personal telephone number where you can receive faxes or voice mail. Nice idea, but we couldn't get a telephone number during our tests.

There's better news elsewhere, with a spacious 50MB of disk space allocated for your site, and e-mail that's accessible via a browser, as well as your normal e-mail software.

Connection speed isn't bad, once you get connected (though we needed to redial a few times before connecting in the first place), and telephone support is available for 50p per minute.

We couldn't get overly excited by these features, though, and visiting the ISP's home page didn't improve our mood. While apparently offering lots of content, it's virtually all extracted from other sites. And sometimes so clumsily that the same travel story on Doing the Inca trail appeared simultaneously in the Headline, Sports and Business news sections.

The real problem with X-Stream is that it's based around a business idea that's past its sell-by date. Being forced to watch adverts to get subscription-free Internet browsing might have made sense two years ago, but with so much competition around, it doesn't any more. And as it doesn't appear to be able to produce a quality unmetered Internet access service, either, it's hard to see where X-Stream goes from here.

PCPlus Verdict

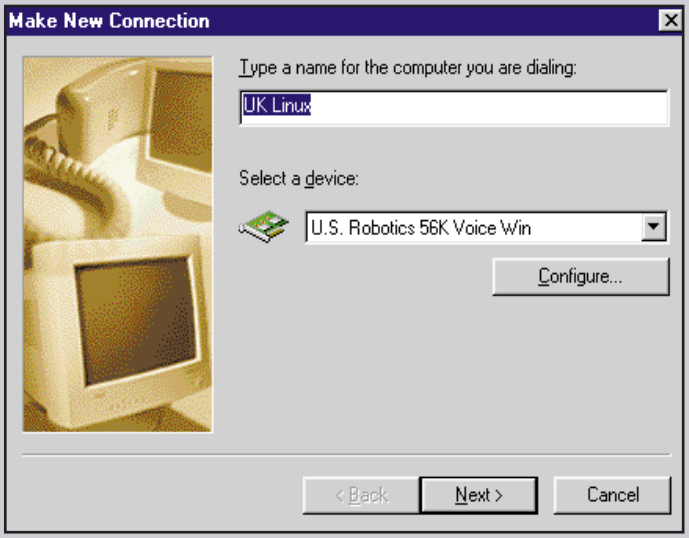
X-STREAM

✓FOR	✗ AGAINST
→ 50MB disk space	→ Bad installation
→ E-mail accessible from the Web	→ Advertising takes up screen space
	→ Low quality home page

Ease of online signup 5
Online help 5
Features 5
Performance 6
OVERALL 5

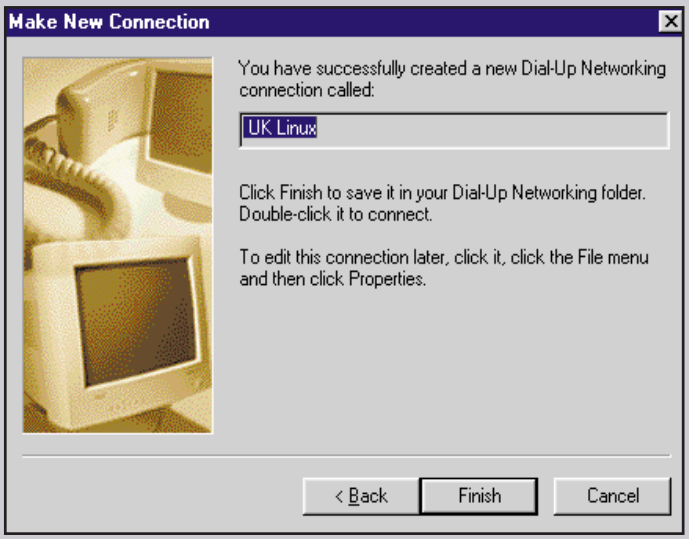
Signing up the hard way

If your ISP doesn't set up Dial-Up Networking for you, then you'll have to do it yourself. Something like this...



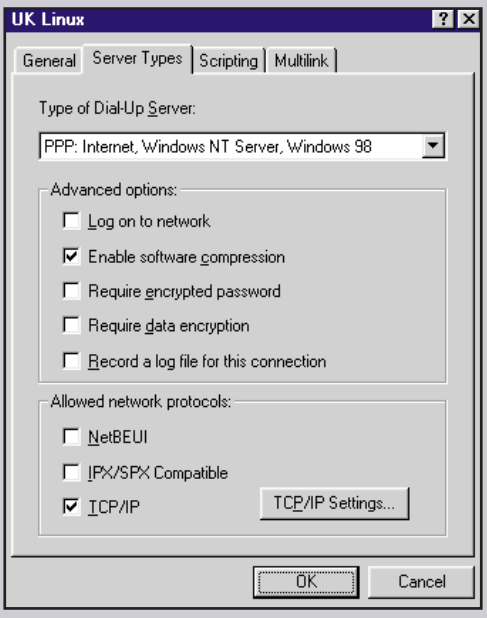
1 To begin, open the Dial-Up Networking folder in My Computer, and double-click on Make New Connection. Type in the name of the ISP you're signing up to and click on the Next button.

2 Enter the telephone number in the box provided. We put the area code in the Telephone number box, too, and leave Area Code blank, which works just fine and avoids complications later. Click on Next.

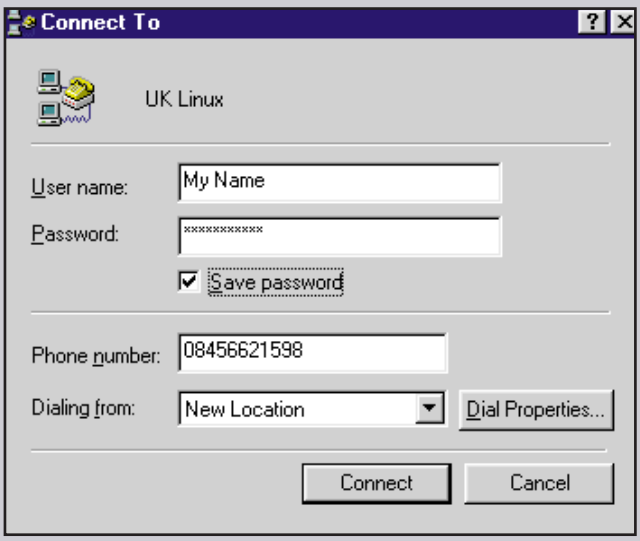


3 We've finished? So soon? No, we haven't, actually, it's just that the wizard doesn't let us enter all the information we need. Click on Finish to close it down.

4 Your Dial-Up Networking folder will be simpler than this, because you haven't been reviewing bunches of ISPs. Right-click on your ISP's icon, and select Properties.



5 Click on the Server types tab. Windows adds lots of options you don't really need and slows things down, so clear all the boxes apart from TCP/IP and Enable software compression. Click on OK.



6 Double-click on your DUN icon, and you'll see there is no user name or password. Enter them, as they were provided by the ISP, check Save password (unless others use your PC, perhaps) and click on OK. You're connected!

At-a-glance specifications

It's worth looking for added value including space for Web pages, e-mail addresses, newsgroup access and speed of service. Compare each service and see what you get:

CONTACTS					
Supplier	**BT Click**	**Contact Box**	**Free4All**	**FreeOnline**	**Freeserve**
URL	www.btclick.co.uk	www.contactbox.co.uk	www.free4all.co.uk	www.free-online.net	www.freeserve.net
SPECIFICATIONS					
Number of e-mail addresses	None	Unlimited	Unlimited	Unlimited	Unlimited
Size of Web space	None	25MB	25MB	Unlimited	15MB
CGI-bin access	No	No	Yes	No	No
UK Content (is it a portal?)	No	No	No	Yes	Yes
Web-mail access to e-mail	There is no e-mail	No	No	Yes	Yes
Downloadable setup	Yes	Yes	No	Yes	Yes
Advertising banners on site	No	Yes	No	Yes	Yes
Online help	Yes	Yes	Yes	Yes	Yes
Cost (per min) of phone support	Local rate	£1 per minute	Local rate	National rate	50p per minute
VERDICT	**6**	**8**	**9**	**9**	**8**

CONTACTS					
Supplier	**TESCOnet**	**UK Fantastic**	**UK Linux**	**Virgin Net**	**X-Stream**
URL	www.tesco.net	www.ukfantastic.net	www.uklinux.net	www.virgin.net	www.x-stream.co.uk
SPECIFICATIONS					
Number of e-mail addresses	10	Unlimited	Unlimited	5	Unlimited
Size of Web space	10MB	20MB	20MB	10MB	50MB
CGI-bin access	No	No	Yes	No	No
UK Content (is it a portal?)	Yes	Yes	No	Yes	Yes
Web-mail access to e-mail	No	No	No	No	Yes
Downloadable setup	Yes	Yes	No	Yes	Yes
Advertising banners on site	Yes	No	Yes	Yes	Yes
Online help	Yes	Yes	Yes	Yes	Yes
Cost (per min) of phone support	50p per minute	75p per minute	No phone support	£1 per minute	50p per minute
VERDICT	**8**	**8**	**8**	**7**	**6**

PCPlus VERDICT

As you can see, free means many things. Look for the hidden extras, like cost of telephone support, extra Web space and so on. And don't be afraid to change services when something better comes up:

Analysis

FUTURE ACCESS

Can Internet access get any cheaper?

Look back over the last few years, and the rise of free Internet access looks like an unstoppable tide, starting with companies like X-Stream, brought to the masses by Freeserve, and now bringing us a host of unmetered ISPs. It seems clear that this is just going to continue, with competition forcing prices down still further, so accessing the Internet is just going to get cheaper. Isn't it?

Well, maybe not. Many ISPs depend on receiving a cut of the revenue raised from all the phone calls they generate, and there's no guarantee this arrangement will continue. We're not even really sure that it should. If BT can afford to give ISPs a cut of your phone call costs, they are clearly charging too much in the first place. What would you rather have – free ISPs with the current phone costs, or a 50 per cent cut in local call rates?

Another complication is coming soon. ADSL (Asymmetric Digital Subscriber Line) is a communications technology that will offer potential download speeds around 12 times faster than a typical V90 modem connection, using your existing phone line. BT is beginning to make ADSL available now, and most of us will be able to have it within two years.

ADSL looks great. Apart from the price. Like everything new, there's considerable investment in setting it up, and early users are going to have to pay. That could mean a setup charge of £150, and a monthly fee of around £40 for as much super-fast Internet access as you can manage.

Professional users, enthusiasts, and the well-off will probably take to ADSL immediately, but others are likely to wait until prices drop. Unfortunately, it's the wealthy users that interest advertisers, so current free ISPs will want to move to ADSL as fast as possible (Freeserve is running trials right now).

And so, the chances are that Internet access right now is as cheap as it's going to get, for quite some time. Costs in the medium term are going to rise, but if we get a much better service, isn't that a fair exchange? Free is great, but fast is better – the really exciting Internet developments are yet to come. PCP

Which ISP is for you?

Most ISPs have their own features to boast about – but are they what you really need?

When choosing an ISP, it's important to focus on your own requirements, and that means you don't get involved in 'the numbers game'. An ISP that offers 50MB disk space, for example, is only better than one offering 20MB if you're ever likely to make use of the extra room. (And as most casual users will struggle to fill 10MB, that's not likely).

It's a similar story with e-mail addresses. Virgin Net offers only five per account, miserly by modern standards – but do you actually need any more? If not, ignore that feature and move on to something else.

None of this means you should ignore new and potentially useful features, just because you don't use them right now. Having Web access to your e-mail account might be handy one day, perhaps if your e-mail program stops working. And even if you don't know how to use fancy Web pages features like CGI, having them available might encourage you to learn.

Some categories of user can base their selection of an ISP almost entirely on a single feature. If you're new to the Internet and not confident with an ISP, you'll want to make sure they have good online help and cheap telephone support. Meanwhile, more expert users might be solely interested in performance; once you know what you're doing, being able to connect first time and at top speed, is just about the most important feature of any ISP.

Of course, the performance of any ISP varies over time, so any reports you might hear from others are quickly out of date. One good solution is to monitor some of the Internet sites that regularly report on the free ISP scene.

Even better, just open a couple of accounts with ISPs that look interesting, and try them out for yourself. Signing up online is usually easy, and seeing what other companies have to offer can be an eye-opener, so why not experiment? It's the only real way to find out which ISP is the best for you!

Which free ISP is the best?

Out of the ten free ISPs that we've reviewed here, there is one ISP that really does give you something for nothing

↑You could do worse than look at Free Online, which offers the best all-round ability and features.

It was a close run thing, with many ISPs having compelling features of their own.

We liked Contact Box, for example, who managed to provide both good Internet features, as well as voice mail and fax capabilities.

Free4All was particularly strong on e-mail and good value Web space features, while TESCOnet is great for families, offering some of the best technical help we've seen.

Among the rest, BT Click make an excellent emergency backup ISP, and while Freeserve may not impress right now, it is trialling some interesting new features, and it's definitely worth keeping an eye on it. UK Linux gets an honourable mention, too, for having the most powerful Web features around in the free ISP world.

Fighting its way to the top of the heap, though, is Free Online, who won out on sheer all-round ability. Unlimited Web space, good online and cheap telephone support, an excellent news server, a reasonable portal page – it just didn't do anything wrong.

If you're looking for a new ISP, we recommend you give Free Online a try. You could pay for fewer features (and some people still do!).

↑If you're a Linux user, rejoice – you finally have a powerful, flexible ISP you can call your own.

↘ The Solo 9300 XL benefits from a large display.

PORTABLE COMPUTER

Gateway Solo 9300XL

PCPlus BENCHMARK 1.26

PRICE £2,583 **EX VAT** £2,199 **SUPPLIER** Gateway **PHONE** 0800 20 2000
ONLINE www.gateway.com/uk

The Gateway Solo 9300KL is an expensive portable, but with a display no other portable can match, and a fast Pentium III processor

While they come in many sizes and configurations, portable computers are meant to be, well, portable. At the bigger end of the spectrum, though, this idea is getting lost in favour of systems that can do all a desktop computer could do but occupy a fraction of the space. The new Solo 9300XL from Gateway is a prime example of this ideology, and nowhere is it more apparent than in the machine's 15.7-inch display.

Capable of a massive resolution of 1,280 x 1,024 showing the whole desktop at once and rising to an incredible 1,600 x 1,200 if you don't mind scrolling around to see the whole screen, the display rivals that of many desktop systems. It is clear and crisp at the higher resolutions, and consistently strong across the whole of its area. You can drop the resolution right down to 640 x 480, but as you get below 1,024 x 768 things start to develop a somewhat fuzzy appearance.

The main consequence of such as big display is an overall large size for the computer. Gateway supplies its deluxe leather case as part of the deal. This looks more like a small suitcase than a computer bag, and is easily big enough to serve as an overnight bag when not occupying carrying the 9300 XL and its associated paraphernalia.

DVD as standard

Gateway is keen to promote this computer as a multimedia machine. It sports a DVD drive and comes with software for playing movies. On the front of the case are reverse, play/pause, stop and forward buttons that enable you to control music CDs and movies without resorting to the mouse. A locking button prevents their accidental use. Sound output is of reasonable quality, and small buttons sitting above the function keys enable you to quickly adjust volume or mute sound altogether. Professional users will find this feature handy when giving presentations.

Internet connectivity is also stressed. Two more buttons above the function keys quick-launch your e-mail software, and start your Internet browser. We are never sure why users like these – a desktop icon does the job just as well, but Gateway clearly feels there is a place for them, and has even included one button which is user programmable.

This computer is expensive, and at the price we would expect it to be at the top-end in terms of specifications. So the Mobile Pentium III processor running at 650MHz is precisely what we want to see providing the power. The 64MB of RAM and 12GB of hard drive are, though, rather less than we would have liked. If you really are going to use this as a multimedia machine, more would have definitely been better on both counts. Still, on the plus side, a copy of Microsoft Works Suite 2000 comes as part of the deal. Among the applications included in the suite are Word 2000, Money 2000 Standard, Autoroute Express 2000 Europe and Microsoft Home Publishing 2000.

When it comes to usability the Solo is hard to beat. That display makes it as easy to work with as many desktop computers, and the keyboard is pretty much full size.

The Solo has all the connectivity options we would expect from a top-notch portable. As well as the usual array of parallel, serial, PS/2, infra-red, VGA out and twin PC card slots, there are video out and video in sockets, a digital audio out port, two USB ports and an IEEE 1394 connector, ideal for importing digital video at high speeds.

Performance-wise, the Solo is strong. Gateway quotes three hours as the battery life. On test we achieved two hours thirty minutes. As our tests are performed with power management disabled, it is likely you will achieve three hours with it turned on. As far as SYSmark is concerned, we are using the new 2000 edition of that software for the first time in this issue, so direct comparisons with earlier machines can't be made. Still, an overall rating of 1.26 with Office Productivity sitting at 116 and Content Creation at 126 is certainly very respectable.

Full stats: see pcplus.co.uk/review

Overall, the Gateway Solo 9300 XL would be an excellent choice if high-quality resolution display is at the top of your wish list, though this comes at a price both in terms of hard cash and computer portability.

Sandra Vogel

PCPlus Verdict

GATEWAY SOLO 9300 XL

✓FOR
→ Large high quality display

✗AGAINST
→ Short on RAM and on hard drive space for a top-of-the-range computer

Specification	9
Quality	8
Performance	8
Value for money	8
OVERALL	**8**

Specifications
Intel Mobile Pentium III 650 MHz, 64MB RAM, 12GB hard drive, 15.7-inch SXGA TFT display 1,280x1,024x 32-bit, PCMCIA 2xType II, USBx2, IEEE 1394x1, IrDA infra-red, internal fax/modem, 1.44Mb floppy, DVD drive
Operating System
Win98 Second Edition
Other information:
Carrying case included. Bundled software Microsoft Works Suite 2000

IBM has come up with a new look for its portable range, but what impresses us most about the T20 is its superb battery life.

PORTABLE COMPUTER

IBM ThinkPad T20

PRICE £3,217 **EX VAT** £2,738 **SUPPLIER** IBM **PHONE** 0800 169 1461
ONLINE www.pc.ibm.com/europe

The T20 is an expensive, top-of-the-range laptop from IBM

PCPlus BENCHMARK 1.43

Specifications
Intel Pentium III 700MHz, 128MB RAM, 12GB hard drive, 14.1-inch display, 1,024 x 768 x 32-bit, PCMCIA 2 x Type II, USB x 1, 1.44MB floppy, 6x DVD

Operating system
Win2000

BATTERY LIFE 3hr54

IBM has had a rethink on its portable computer product line, streamlining it into one group of large format 'all-in-one' portables whose names are prefixed with the letter A, and a second group of 'thin and light' machines, with names prefixed by a T. Our review machine falls into the second category.

Because it's designed as a thin and light machine, IBM only provides one drive bay in the case. Called UltraBay 2000, you hotswap the supplied floppy and DVD drives into it and a mechanical switch starts the process. After a pause for an on-screen report, it is okay to remove the drive. Then you simply take the old drive out and pop the other one into place.

Innovative elements

IBM has implemented several innovations in this portable. The UltraPort connector, sitting on the top edge of the display, is designed to accommodate a digital stills or video camera, which makes videoconferencing easy. We didn't have a suitable camera to hand to try, but the concept is a sound one and makes the T20 a viable alternative to smaller portables like Sony's Vaio which has a camera built in. IBM's press information states Sony will make a Bluetooth connector for this port available soon.

Another innovation is the ThinkPad button. This sits above the keyboard and sends users to what is, in effect, a multimedia version of the user manual. It is a good idea, well implemented, but it is a pity there isn't a printed manual as well. The ThinkPad button can also link in to the new ThinkPad Community Web page which gives access to technical support services and user forums. Corporate IT managers, for example, can customise the operation of this button, sending users to an Intranet or providing on-system company information.

The final innovation is the ThinkLight. This is a tiny light that sits above the display on the inside of the clamshell, and which can be turned on and off using a function key combination. The idea is to illuminate the keyboard when it is dark, enabling you to work in what would otherwise be difficult conditions. While the display always sheds some light on the keyboard, the addition of this extra source does make a difference.

Sleek design

Design-wise, IBM has stuck to its usual high standards with this computer. The black titanium casing is both sleek and strong, and certainly makes the T20 look every inch the executive portable computer. This look is part of what you pay for when you choose IBM. The price of £3,217 is steep, even considering the high system specifications.

Everyday use

When it comes to everyday use, the T20 does not disappoint. The 14.1-inch display is bright and delivers at a resolution up to 1,600 x 1,200 if you don't mind the fact that you can't see the whole desktop at once. This resolution is more suited to use on an external monitor than the portable itself.

The keyboard is a raised key design, and touch-typing was not a problem. IBM's preferred system of cursor control is the TrackPoint. This comprises a pointing stick which sits on the keyboard and two buttons that emulate left and right mouse buttons. A third button sits below these two, and takes on the tasks which is usually done by the wheel on a wheel mouse – scrolling through documents and so on. It is a neat arrangement and worked well on test.

Connectivity options are only marred by the presence of one, rather than two USB ports. This is joined by a PS/2 port, parallel and serial connectors, stereo line out and mike in, S-video and external monitor sockets, two PC Card slots, and line out for the built-in modem and Ethernet cards.

With its power supplied by a PIII running at 700MHz, the T20 is a top-of-the-range model. The 128MB of RAM and 12GB hard drive confirm its status. It is unfortunate that one of the modules in our Sysmark 2000 benchmarking software, the PowerPoint module, refused to complete despite our best efforts, so the results reported for the Office Productivity tests were calculated from the other five tests that Sysmark runs in this category.

IBM has one final ace up its sleeve that just might make you consider buying the T20, despite its price: The battery provided a massive 3 hours 54 minutes – just six minutes short of the magic four hours mark and enough, with careful use of power management, to see users through an extensive period of work. We are impressed.

Sandra Vogel

Full stats: see pcplus.co.uk/review

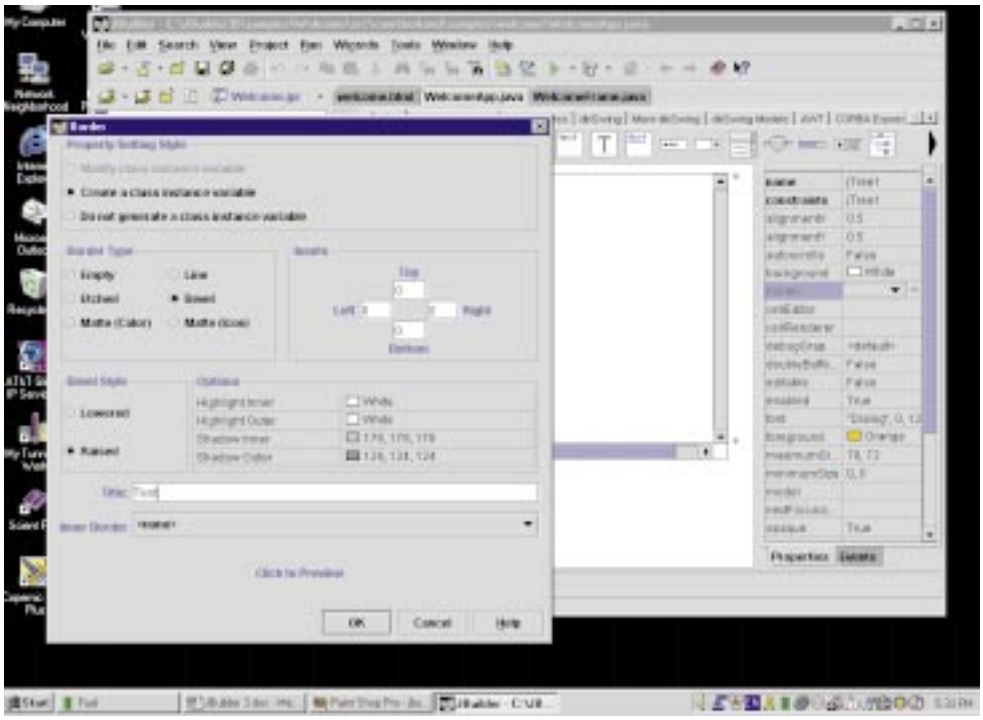
PCPlus Verdict

IBM THINKPAD T20

✓FOR
- Good looking
- Nice hot swapping of drives
- Excellent battery life

✗AGAINST
- Expensive
- Rather heavy for a 'thin and light' computer

Specification	9
Quality	9
Performance	8
Value for money	7
OVERALL	**8**



JAVA DEVELOPMENT APPLICATION

JBuilder 3.5 Pro

PRICE £551 **EX VAT** £469 **SUPPLIER** Borland/Inprise **PHONE** 0118 932 0022
ONLINE www.borland.com **E-MAIL** info@inprisecustserv.co.uk

A powerful, cross-platform Java development application packed full of tools and features

When the postman staggered to the door with the JBuilder 3.5 package we knew we were in for something big.

Opening the box we found it packed with goodies. Most of the weight is the manuals – including a two-volume component reference. With these in the box JBuilder 3.5 is much more than just a Java development tool – it's a complete distributed application development environment. If you purchase the more expensive Enterprise edition, aimed at experienced developers, you'll find that along with JBuilder 3.5, there are CD-ROMs for Inprise's Application Server, the InterBase 5 database (for Windows, Linux and Solaris), Delphi 4, and C++ Builder 4.

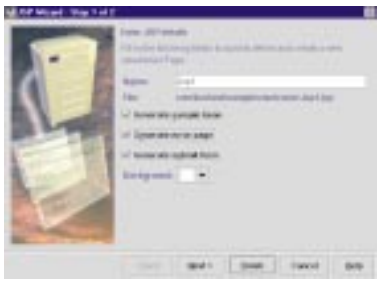
JBuilder 3.5 Pro is a complete Java development environment, and comes with a large library of JavaBeans which you can use to create your own Java applications and applets, including all the Swing user interface components. You can use JBuilder's graphical user interface builder to connect components together, including database connections and tools for displaying the results of SQL queries.

If you're having problems with your applications, there's an excellent set of debugging tools. You can track down the most intractable of bugs across multiple versions of the Sun JDK and in Java applications running in different processes.

Requirements
All platforms – 128MB RAM, 150MB disk space
Windows: 98/NT 4.0, PII 233, Linux: Red Hat 6.X, Mandrake 6.X, 7.0, PII 233, JDK 1.2.2 or above, glibc 2.1.1 or above, kernel 2.2.5 or above
Solaris: Solaris 2.6 or Solaris 7, UltraSPARC 2

Tested on
PII 300MHz 128MB RAM, Windows NT 4.0 Workstation

Extra information
Foundation and Enterprise versions also available. Foundation version is free to use. Various upgrade prices available – see Borland's Web site



↑ If you want to work with the latest Web technologies, JBuilder is an ideal place to start. It supports Java servlets and gives you wizards to help you get started with using them.

One thing to remember is that JBuilder is a Java 2 development environment – unless you're careful creating applets, they won't run under Netscape 4.x 's or IE5's 1.1.x Virtual Machines.

Web application developers are using Java to run complex server applications, and JBuilder is designed to offer the latest Java features to aid in their development. The key to this is JBuilder's Java Servlet support, which enables you to replace CGI technology with Java applications. Using the Servlet Express tool you can create both the servlet and its HTML front end. Servlets are an important technology, and this feature is more than enough to make us recommend JBuilder. There's even a built in Web server for testing your servlets.

If you've been following David Griffith's tutorials on Java Server Pages, you'll love JBuilder 3 Enterprise edition. It enables you to create HTML pages with embedded Java code and includes a JSP wizard to create a framework that you can then fill out with your code.

While the Professional version is designed to give you quick and easy access to databases, more serious developers may wish to look at the Enterprise edition, which is focused on the latest Java 2 Enterprise Edition (J2EE). The key to using J2EE are Enterprise Java Beans (EJB) which enable you to encapsulate an applications business logic in objects that have standard interfaces. The standard JBuilder JavaBeans constructor, BeansExpress, has been extended to add EJB support. With EJBExpress you can create both Session and Entity EJBs, which are able to handle complex business functions. You'll need to work with a good object-modelling tool to get the most out of these features, as developing enterprise class distributed application is a complex process.

← Java 2 introduced the Swing GUI components, which replaced the awkward and difficult to use AWT. JBuilder 3.5 contains a GUI builder designed to use Swing, which generates the relevant Java code and adds it to your application.

JBuilder will also support the CORBA standard for distributed application integration, so you can link Java and C++ components into one application.

One key feature of JBuilder is that it is a Java application in its own right, so it's easy for Inprise to port it to multiple platforms. If you are developing cross-platform Java server applications, you'll find the ability to test and debug on three leading server platforms an important feature of JBuilder 3.5. While Java is ostensibly identical on all platforms, sadly there are incompatibilities between JVMs. We'd have liked to have seen support for MacOS servers, especially as MacOS X is at heart a BSD Unix.

If you're want to develop Java applications, then JBuilder 3.5 Professional is the tool for you. It's packed full of features and tools that make creating Java applications and Java Web servers easy. And if you don't need all the features of the Professional edition, there's also the free Foundation edition. You won't be able to create large-scale Web applications or business systems with this, but it's certainly able to get you working with Java and JavaBeans development. One thing you can be sure of – in all versions – this is a package that more than pulls its weight...

Simon Bisson

PCPlus Verdict

JBUILDER 3.5 PROFESSIONAL

✓FOR
→ A powerful cross-platform Java development environment for application and Web development

✗AGAINST
→ Requires high specification development system

Specification	10
Quality	9
Performance	8
Value for money	8
OVERALL	**9**

PCPlus BEST VALUE

↙ Good looking and quick, Lexmark's Z52 is a worthy successor to the Z51.

INK-JET PRINTER

Lexmark Z52 Colour Jetprinter

PRICE £139 **EX VAT** £118 **SUPPLIER** Lexmark **PHONE** 08704 440044 **ONLINE** www.lexmark.com

The Z52 sets a new low price point for a photographic quality ink-jet, but does it live up to Lexmark's claims?

Lexmark makes quite a few claims for its new Z52 ink-jet. It starts with a pretty incontestable one – this new top-of-the-range home printer costs just £139, probably less if you know where to shop. This sets a new low price point for a printer capable of quality photographic reproduction.

Lexmark's second claim is that the Z52 has a top resolution of 2,400 x 1,200dpi. This again is a new record for an ink-jet printer, though we're less convinced of the need for this huge number of ink droplets. Top lifestyle magazines use the equivalent of around 600dpi for reproducing high-quality pictures of house interiors and new fashions, so why would you need to print at four times this resolution?

The third major claim is that the Z52 provides a new top print speed of 15ppm, putting it on a level with many personal lasers. This is the first claim we tested. We ran our standard letter print, around five percent ink cover, and produced five copies in 1:27, equivalent to roughly 3.5 pages per minute.

↑ The photographic quality falcon print was hard to distinguish from a photograph, but the same image on plain paper was much less vivid, and showed noticeable dither patterns.

Ah, but Lexmark's figures are for draft mode print, which saves ink but doesn't look as good. We repeated the test using our sample letter, and this time printed five pages in 39 seconds. This comes out as 7.7ppm – still only half the rated speed. Finally, we reconnected the printer using a USB link rather than a parallel cable. The draft print then took 33 seconds, excluding rasterising time. This gives an absolute top speed of 9.1ppm.

The high resolution 5 x 3-inch photograph at the printer's top resolution of 2,400 x 1,200 took 9 minutes 47 seconds. Compare this with the HP DeskJet 930C, at 4 minutes 44 seconds, or the Epson Stylus Color 760, which completed it in 4 minutes 29 seconds. Given the number of dots it's placing, Lexmark's high-res speed is impressive, but in real terms, it's still taking twice as long to print.

Print quality

The resulting falcon print from this test, on glossy photo paper, was very detailed. Every feather was picked out and the shading on the beak was very smooth and natural. However, the same print on plain paper lost both definition and colour saturation and you could see the dither in the picture background. The vector train print came out over-bright, using lighter and more intense reds than the original and there was notable banding on the presentation graphics sample. Text print was dark and dense.

The printer is a neat, medium-sized machine, which feeds paper or card up to 270g/m2 from a near vertical tray at the rear to a pull-out tray at the front. The top cover lifts to reveal twin cartridge holders and black and tri-colour cartridges are simple to fit. Consumable prices give a page print cost of 4p for black, rising to 14p for 20 per cent colour. These costs pitch the printer in the middle of its competitors.

The Z52 has both parallel and USB sockets, though cables for neither connection are supplied. Supplying cables would be a quick way to steal a march over its rivals, and a bundled USB lead would certainly be an advantage. People using the USB connection are less likely to be upgrading and to have a spare lead from an old printer.

The Colorfine driver is comprehensive, with facilities for manual duplexing and printing multiple pages per sheet. A separate CD of classic paintings from the Louvre and other European galleries is provided, so you have plenty of material to experiment with.

Lexmark's Z52 is a quick and effective printer, particularly at the price. Even though it doesn't quite live up to Lexmark's claims for speed, it's quick and well designed – very good value.

Simon Williams

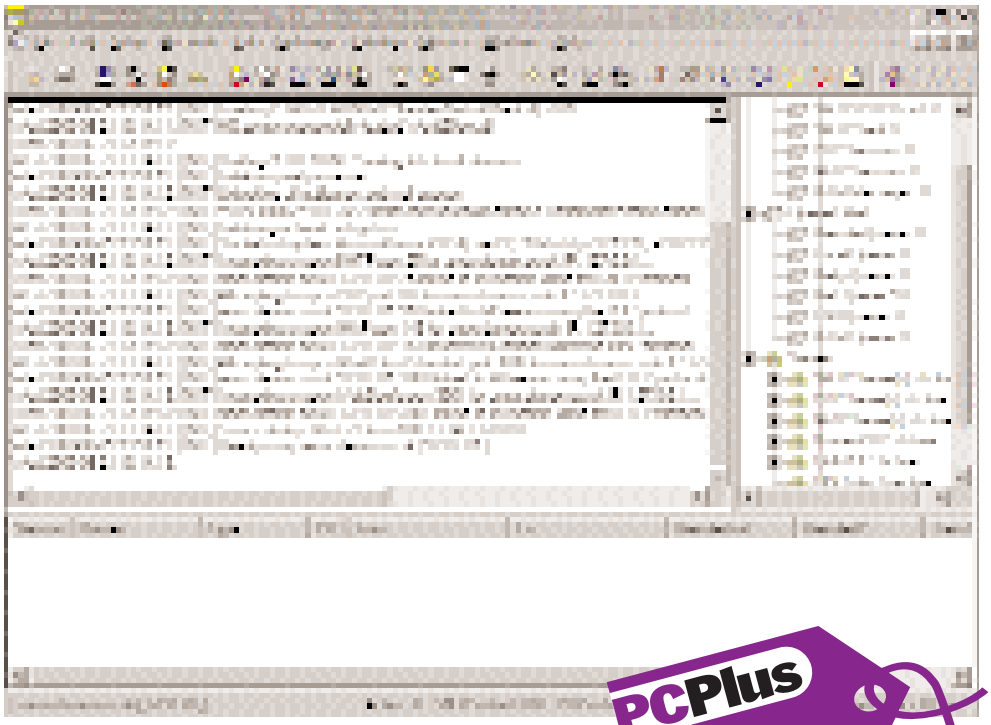
Specifications
Maximum Resolution: 2,400 x 1,200dpi
Maximum quoted speed: 15ppm (black cartridge, draft print)
Paper tray capacity: 100 sheet (60g/m2)
Max Paper weight: 270g/m2
Ports: Parallel, USB
Software: Print gallery, ColorFine printer driver
Dimensions (open): 521mm(W) x 444mm (D) x 287mm (H)
Operating Systems
Windows 95/98, NT4/2000, DOS under Windows

PCPlus Verdict

LEXMARK Z52 COLOUR JETPRINTER

☑ FOR	☒ AGAINST
→ Fast text print	→ Slow photo print
→ Low price	→ Flawed plain paper images
→ Quality photo prints	

Design & paper handling	9
Print quality	7
Speed & memory	8
Value for money	10
OVERALL	**8**



PCPlus BEST VALUE

SERVER

MDaemon mail server

PRICE $200 **SUPPLIER** Deerfield **BUY ONLINE** mdaemon.deerfield.com

How about installing a mail server at a fair price, collecting all your mail from one machine and running an internal mail system as well

Tested on
Athlon 600

Extra Information
Pro Version available with extra features. The price quoted is for a six-user version. Please check the Web site for multi-user prices

Most ISPs will give you space for Web pages on their server and several e-mail addresses. This is fine for a single machine because different users can log in and download their mail. If, however, you're running a small network at home or in the office, it's useful to have downloaded mail distributed to each particular user on the LAN. You can use rules to check for individual names and move e-mails to separate folders. However, short of setting up something like Microsoft's Exchange server on NT or 2000, you'll be hard pressed to run a proper internal mail system on a standard Windows installation.

Several shareware mail servers are available and, if you take a quick visit to

tucows.mirror.ac.uk/mailserver95.html

TUCOWS (The Ultimate Collection of Windows Software), you'll find quite a selection. One of these that stands out is version 3.00 of Deerfield's Mdaemon server. It's been around for some time and, as such, runs with all versions of Windows from 95 upwards. TUCOWS has awarded it a full five gold cow rating!

It comes in two versions: the standard is available as a 30-day trial download but you can buy versions from 6 users up to unlimited user. This will probably be the version of most interest to you if you're running a small network, but a professional version is available and this provides an enterprise-class e-mail solution suited to ISPs and large businesses. It includes all the features of MDaemon Standard 3.0 plus Multiple Domain Support that increases network efficiency and performance by managing e-mail for multiple domains or organisations with a single MDaemon server. It also adds IMAP4 support, a sophisticated client/server protocol for retrieving e-mail from a mail server. IMAP4 has the ability to create, manipulate and synchronise folders or mailboxes on your server. It also enables 'virtual teams' to work from a single mailbox.

When MDaemon is running, the system monitors the flow of mail activity to its own log.

MDaemon Standard 3.0 is targeted at small and medium-sized businesses. You can use it to access a single dial-up ISP from one machine on the network and download mail for all the other users on the network, without having to invest in expensive gateways, routers or dedicated lines. The mail is then distributed to individuals the next time they check for mail. In a similar way, any mail you create is sent to the MDaemon designated server and, the next time it connects with your ISP, the mail is uploaded. Each machine on your network requires an individual IP address, so internal mail can be handled seamlessly alongside POP3 and you could host an entire domain with MDaemon's full-fledged SMTP server.

Once you've got to grips with the features available on the server, you should be able to set up a working mail system on your local network with little trouble. However, there are many extras in this package and you could be tweaking for years to come. One thing's for sure: you'll be a mail server guru by the time you finish. Try the 30-day trial download, it's about 6MB but you get a month to find out if you like it. We do.

Paul Warner

New features

How to make your network run more smoothly

SpamBlocker Keeps your network free of unwanted e-mail, saves network bandwidth and reduces mailbox clutter, by incorporating a black list of known Spam sites.

WorldClient Standard MDaemon 3.0 enhanced integration with the Web based e-mail client, creating efficient access to user accounts and active sessions, while enabling greater administrative control.

Enhanced Alias Editor Saves time by enabling users to alias an entire e-mail address within or outside a system.

Programmable API MDaemon's new programmable API enables the end user to develop custom programs to interface with MDaemon.

Header Translation Increase network security by searching for specific sensitive content within e-mail message headers and replacing it with altered text on outgoing messages.

SMS Gateway Support Receive important messages via your cell phone or pager by redirecting incoming mail from MDaemon to your SMS gateway server.

PCPlus Verdict

MDAEMON MAIL SERVER

✓FOR
- A sophisticated and solid mail server

✗ AGAINST
- A steep learning curve if you're not familiar with server technology

Specification	9
Quality	9
Performance	9
Value for money	10
OVERALL	**9**

← There's nothing to compare with this brilliant drive.

CD-RW DRIVE

Mirai CRD-BP2-M

PRICE £245 **EX VAT** £209 **SUPPLIER** Contact Mirai for nearest dealer
PHONE 0870 845 6666 **ONLINE** www.mirai-technologies.com

The greatest single step forward in CD recording we've seen

Requirements
Tested on K6-200 (We used a slower machine to test the claimed performance)

Extra Information
SCSI card included. Version 4.02 of Nero Burning ROM software supplied

If the claims that Mirai makes are true, you may as well bin your old CD-RW drive. Mirai's latest drive uses new BURN-Proof technology (with BURN standing for Buffer Under RuN) developed by Sanyo.

When you create a new CD-R, the source data has to be supplied in an uninterrupted stream to the writer. Most drives fit a large buffer to try to regulate the flow. However, any other activity on the machine can slow this down and, once the buffer empties, you can chuck your new CD. Sanyo has developed a technology that claims to overcome under-run completely. If the write buffer empties, then the drive stops writing and waits for the write buffer to fill up. Then comes the clever bit: It can retrace the data already written to the CD-R, synchronise the data stream, detect the end of the previous recording and carry on where it left off.

→ Performance

CD-Tach CD Rating	21.2x
Buffer	2MB
CD Full stroke access	278ms
CD Random access	1,130ms
100MB Data transfer (Data read from external and internal track on CD)	Fastest 28s Slowest 45s
20MB file write to CD-R	29s
20MB file write to CD-RW	50s
Copy CD 640MB	11 minutes

The tests

How did it do in our tests? We used the standard CD-Tach software to test its CD performance. As you'll see in the results table below it performed well, returning a CD rating of 21.2x which is one of the fastest we've seen on a CD writer. The other data read tests came out exceptionally high, with one of the best transfer rates from CD to HD of a 100MB file we've ever seen.

To test the write times we used our old favourite, Nero Burning ROM. This software is supplied with the drive and is one of the few to support the new BURN-Proof technology. We used the same test on the Mirai as we used for a recent CD-RW group test and the results were impressive. It outperforms every other drive in writing to both CD-R and CD-RW – the result was 15 per cent faster than that of the fastest CD-RW in the group test and we produced a CD copy at a full twelve speed write in eleven minutes.

To test the BURN-Proof technology, we decided to go for a repeated disk copy. We ran ScanDisk on the hard drive, installed Paintshop Pro over the network and downloaded some software from the Internet at the same time. This is the kind of load that would trash a normal CD-RW but the Mirai produced a perfect copy.

No more turning off the screen saver and logging off the network before you burn. Forget all the old tips involved with creating CDs – you can let it get on with it in the background while you carry on normally. This must be the single greatest step forward in CD recording we've ever seen. And forget the price, it's not exorbitant for a SCSI drive with a card thrown in.

The version of the Mirai drive that was supplied for our review came with an Advansys SCSI card. Although it's not the most sophisticated card, it supports several devices.

If you are planning to use SCSI seriously, you would be advised to connect devices like hard drives to a faster card. You can still use the new card for this drive, provided it's fitted with an internal 50-way SCSI ribbon connector. We tried it on an Adaptec 2940UW2 card and it performed flawlessly.

Looking to the future

Mirai is one of the first to use BURN-Proof technology but expect to see it becoming the standard for CD writing – Plextor has also released a BURN-Proof drive. Without doubt, it will also have implications in other areas including DVD creation and any other process that needs to exactly retrace a data stream and pick up where it left off. We've heard a whisper that the next version of BURN-Proof will be able to retrace a data write, even after a you've shut down your computer.

In conclusion

This is the way forward and if the other CD-R manufacturers don't license this technology or develop something similar soon, they may as well give up manufacturing drives.

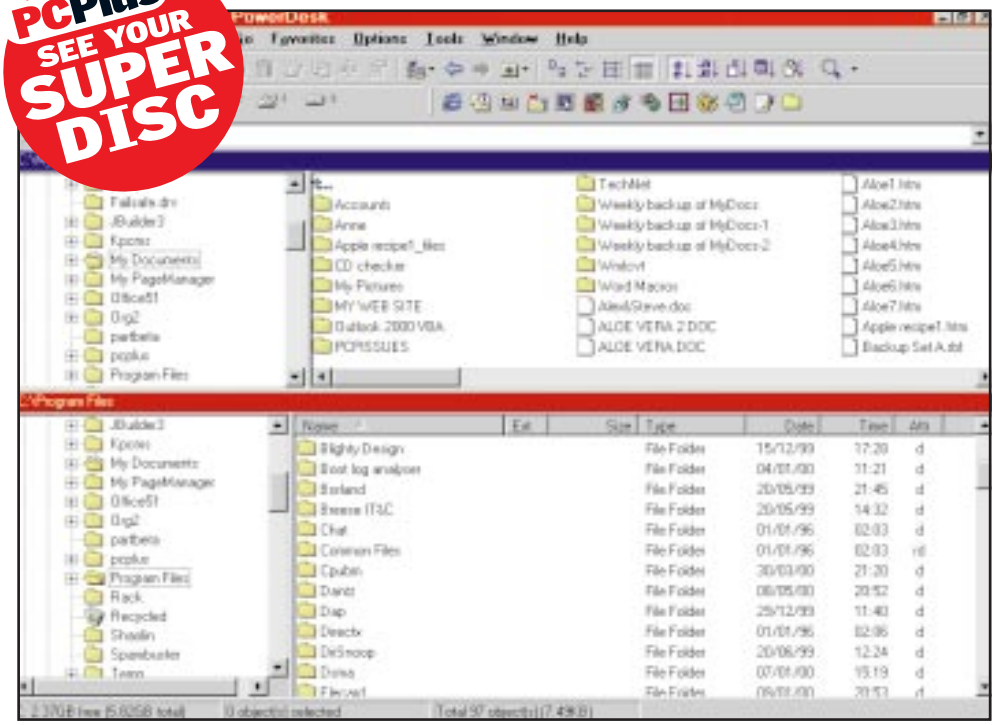
The Mirai CRD-BP2-M is a derserving winner of an Editor's Choice award: The performance is unchallenged and the price is not over the top. A brilliant drive.
Paul Warner

PCPlus Verdict
MIRAI CRD-BP2-M

✓FOR	✗AGAINST
→Everything	→Nothing

Specifications	10
Quality	8
Value for money	10
Performance	10
OVERALL	**10**

PCPlus SEE YOUR SUPER DISC



↑PowerDesk in dual-pane mode. The folder trees can be turned off and a file preview window kept open. Note the toolbars at the top.

FILE MANAGER

Ontrack PowerDesk 4 Pro

PRICE £14 **EX VAT** £12 **SUPPLIER** Ontrack Data Recovery **PHONE** 01372 741999 **ONLINE** www.ontrack.com

A must-have replacement for Windows Explorer with plenty of neat tricks up its sleeve

Decent file managers were coveted items back when the command line was king. Just mention Xtree Gold to an old-timer and watch his eyes brim with tears of nostalgia. But Windows has Explorer and most people find it adequate. That hasn't stopped Ontrack producing PowerDesk 4 which sets out to usurp Explorer's place on your desktop.

PowerDesk packs all sorts of tools, gadgets and enhancements to make file management a slicker experience, but borrows enough of Explorer's personality to make you feel right at home.

Heading the window are toolbars which can be turned off if you hate clutter or can't spare the space. One offers standard file management tools, another gives single-click access to drive letters, and the third is a launchpad for application and file or folder shortcuts. The fourth bar is a command line similar to the Start menu's Run dialog.

The file management and quick-launch toolbars can be personalised to show preferred icons. You can also create toolbars of your own to include quick access to the contents of the Programs menu, printers, system resource monitoring charts, two desktops, and functions such as Windows shutdown and restart. These Dashboard-like custom bars dock at the top of the screen, integrate with the Windows taskbar or float free.

Moving down to the folder and file views, PowerDesk supports dual panes so you can open two directories at once. The folder tree can easily be toggled on or off, and another welcome improvement is the restoration of double-dot to its rightful place at the top of listings. Selecting this takes you up a folder. We never understood why MS dropped this in favour of a toolbar button and the [Backspace] key when Windows 3 gave way to 95. If you don't like it, you can turn this feature off – PowerDesk is highly customisable.

Right-clicking an item gives exactly the same context menu as Explorer's, but with an additional PowerDesk sub-menu. This opens out to present options which depend on the nature of the selected item, but typically include copy and move, picture format conversion, Zip file management, disk formatting/erasure/copying and folder synchronisation.

An optional file preview pane supports a claimed 200 formats. We weren't able to test every one, but some examples illustrate the quality range. Bitmap graphics are good. The Excel viewer displays multiple sheets within a workbook, allows column resizing, but makes a hash of charts. Simple HTML files display well enough but the viewer soon shows its limits. And the PDF display is only just usable. Unknown formats can be viewed as text or as a traditional hex dump.

As you explore PowerDesk, whole new vistas of functionality are revealed. It'll handle FTP site management, enabling us to update a Web site with ease. Other tools show you the size of folder branches, work with UUencoding, compare folder contents, print folder listings... the list is extensive.

↑This tool shows how much room complete folder branches occupy, so you know who's been gobbling up your hard disk.

Requirements
16MB RAM (Win9x)/32MB (Win NT/2000); 20MB disk space
Tested on
366MHz Celeron, 128MB RAM, Win98 SE
Extra information
Freeware version available from www.ontrack.com and our **SuperDisc**. Full version can be obtained via the Net – see the Ontrack Web site.

A further trick is to reveal the contents of archive files – Zips, Cabs and other popular formats – and access their contents directly as if they were folders. The facility doesn't extend to application file dialogs as it does in ZipMagic, or run at a deep enough level to allow a program to find companion files within the archive, but it's a good feature all the same.

Excepting a couple of minor bugs, the only real sticking point we found was that the program can be slow on lower-end hardware. For instance, file and folder lists are laggardly when you open a branch or scroll through. This can be improved by telling PowerDesk to use generic file icons rather than pick out the different ones belonging to every file. Opting for this still leaves residual sluggishness, though.

PowerDesk 4 Pro won us over. We can think of more features which would add value to future versions – batch renaming of files, for example – and we saw occasional glitches that need sorting. But none of that alters the fact that buying PowerDesk 4 Pro is £14 well spent. Judge for yourself – a freeware version with a reduced feature set is available from the Ontrack site, and there's a copy on the **SuperDisc** this month.

Ian Sharpe

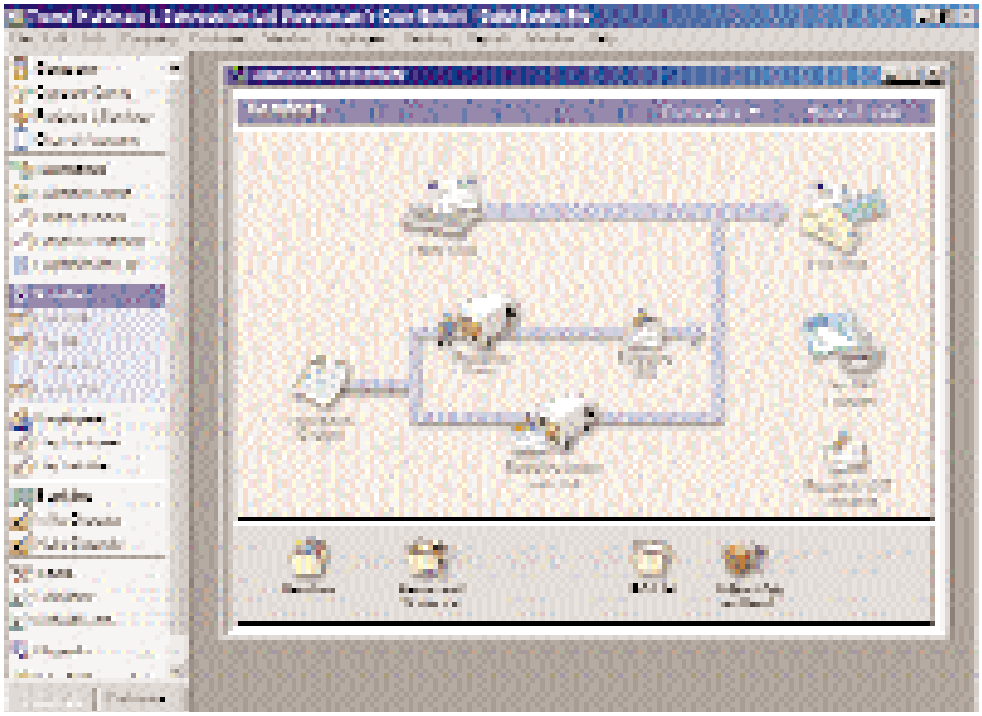
PCPlus Verdict

ONTRACK POWERDESK 4 PRO

✓FOR
→ Loads of tools and enhancements, many of which you'll use every day

✗AGAINST
→ Sometimes slow
The odd bug. You can always think of yet more features you'd like!

Specification	9
Quality	9
Performance	8
Value for money	9
OVERALL	**9**

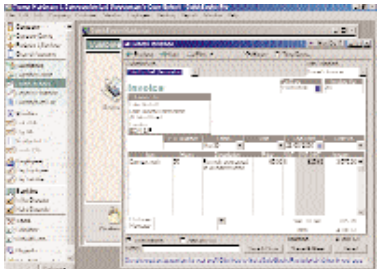


ACCOUNTING SOFTWARE

Intuit QuickBooks Pro 8.0

PRICE £199 **EX VAT** £169 **SUPPLIER** Intuit
PHONE 0800 585058 **ONLINE** www.quickbooks.co.uk

All you need for small business accounting, neatly wrapped-up in a snazzy interface



↑ **Data entry forms tend to look like real world documents in QuickBooks Pro, you can print this in foreign currency as well.**

Accounting software has a serious job to do, but that doesn't mean it has to be seriously hard work to use. QuickBooks Pro 8 is one of the new breed of SOHO accounting packages, designed from the ground up to be easy to use for the first-time user – but chock full of useful timesaving accounting features.

Central to the way QuickBooks operates is the combination of newly re-designed navigation bar and company, customer and vendor centres. The navigation bar gets you quickly to where you want to go, and the various 'centres' provide all the features you need in one place when you get there.

The customer centre displays a flowchart of accounting process associated with sales. You get icons for entering estimates, invoices, refunds and credits, along with receiving payments and making deposits to the bank. The visual effect is easy to understand, and the terminology is aimed at the non-accountant.

New users will also find the set-up wizards helpful. In particular, the EasyStep interview wizard gathers together all the information needed for a whole new set of accounts. It can still take a fair amount of time, but usefully you can close down and carry on later where you left off. In everyday use, QuickBooks also tries to appear familiar to those more used to manual procedures. You will find most of the data entry forms tend to look like their paper counterparts. Behind the scenes, however, the power user can still get at the accounting registers themselves and enter data directly into the accounts.

Powerful accounting engine

The software can track customer credit accounts. If you decide to go for the QuickBooks Pro version you can create estimates and assign these to jobs. Later it bills the estimate in stages – neat.

← **The new navigation bar, customer and vendor centres make finding your way around the accounting features a breeze.**

QuickBooks also features a fully customisable invoice layout, and you can either just click the fields you want to print, or modify the whole thing in the WYSIWYG layout generator.

From the vendors centre you can record bills received from suppliers, which QuickBooks keeps track of and then offers up for payment when due. New to this version are the detail centres – where either vendors or customers accounts can be seen with all the relevant details on-screen at one go. This means you can keep watch on open invoices and payments received, alongside outstanding orders – all in one place.

QuickBooks also keeps together everything to do with the bank, cash and credit card accounts. From here you can create any number of accounts, transfer money from one account to another, write and print cheques and make deposits. Cash received from customers can be held in a central deposit account, and you can pay this into the bank later – which again is similar to real life.

QuickBooks looks good, and with the new features looks strong against the likes of MYOB or Sage Instant. The look and feel is excellent, and the ability to export to your accountant and then import their adjustments at the end of the year puts QuickBooks ahead of both.

Tim Woodward

Requirements
Pentium PC or higher with 32MB RAM, 85MB free hard drive space, Windows 9x/2000/NT 4 or later

Tested on
Intel Pentium II 350MHz with 64MB RAM running Windows 98

→ Upgrading to version 8

Should you pay the extra money?

You get £40 off for upgrading to this latest version of QuickBooks Pro, so is it worth it? Well, version 8.0 adds the ability to e-mail invoices, statements and orders directly to your customers in PDF format – which is another small rung on the ladder to electronic trading. You also get a built-in currency calculator and the ability to invoice in foreign amounts – a nod in the direction of international trading.

The new customer detail and vendor detail centres are a great place to see all the activities of an individual account on one screen, and tighter integration with MS Word, Excel and Outlook is very welcome. There are plenty of customer suggested enhancements as well – so if yours is here it might be worth the upgrade.

PCPlus Verdict

QUICKBOOKS PRO 8.0

✓FOR
→ Looks good and does the job well

✗AGAINST
→ Lots of features means lots of learning

Specification	9
Quality	9
Performance	8
Value for money	9
OVERALL	**9**

↙A clever twist to the display makes the Izzi Swivel an appealing computer.

PORTABLE COMPUTER

Samsung Izzi Swivel

PRICE £938 **EX VAT** £799 **SUPPLIER** Samsung **PHONE** 0800 521 052
ONLINE www.samsungelectronics.co.uk

Samsung's Izzi Swivel can be used as either a standard portable computer or a tablet device

The Izzi Swivel is not Samsung's first portable computer to feature Microsoft's Windows H/PC Pro. Its debut machine, the Izzi Pro, was reviewed back in issue 160. This one is closer to Vadem's Clio than its earlier namesake and offers, if you'll excuse the pun, a new twist on things. The Swivel in the machine's name refers to its display feature. You can open the portable in the conventional, clamshell-style manner and, thereafter, twist the screen on a central pivot through 180° and lie it back down flat on top of the keyboard. The computer is transformed into a tablet device, ready for input direct to the touch-sensitive display. The stylus is housed in a compartment on the Izzi Swivel's lid so it's easily accessible, whichever position the screen is in.

It is a clever idea, and one which should make the use of this kind of machine for data gathering in the field easier. We can imagine market researchers migrating to it from the dedicated tablet devices (that lack keyboards), which some of them currently use. There is a negative point, though. The display is a DSTN type, poorer quality than TFT and only runs to 256 colours. It isn't at its best in direct sunlight, so doorstepping could be difficult on bright days.

The rest of the Izzi Swivel's specifications add up to a very neat machine. H/PC Pro supports PCMCIA and Compact Flash for expansion and data storage, USB for connectivity and VGA-out for presentations. Samsung has implemented them all in this device, and provides appropriate leads for the VGA out connector. This could be particularly useful because it means you can deliver PowerPoint presentations without any additional purchases. Users who find carrying a standard portable around a drag may appreciate that the Izzi Swivel is a mere 1.15Kg.

The machine includes a built-in modem, so using the Internet should not present any problems. H/PC Pro also supports touchpads, but Samsung has not incorporated one, thinking, quite rightly in our view, that tapping the screen is much more likely to be the user's preference for cursor movement.

The built-in voice recorder that comes as part of Windows H/PC Pro can be activated either using software or via record, play and stop buttons on the front of the case. These can be used even when the device is closed and switched off, enabling you to make quick voice notes to yourself without powering up. There is a lock button which stops these accidentally being depressed when the Izzi Swivel is in a briefcase or in transit.

Site is everything

The Izzi Swivel is one of the smaller H/PC Pro machines we've seen: Its dimensions are 227mm wide x 197mm deep x 30mm high. Any smaller and we would be tempted to call it 'pocket-sized'. This accounts for the relatively small display, and also for a small keyboard. Indeed, the qwerty keys on our Series 5mx are not much smaller than those here. While we found it possible to touch-type without difficulty, users with large hands may have problems.

Battery life should not present a problem. One of the great benefits of H/PC Pro is that it provides far longer battery life than a standard portable computer. In this case, Samsung expects eight hours of use from its internal battery, and an optional 6x alkaline battery pack should deliver a further ten hours.

While the swivel display is a novel and potentially useful feature, other aspects of this machine are minimalist. With its earlier Izzi Pro, Samsung took advantage of the touch-sensitive display area to provide application shortcut buttons, but none are to be found in this model. Indeed, the overall look and feel of this machine is one of clean lines.

In everyday use, the Izzi Swivel is pleasant enough, and we have no real complaints per se. The tablet orientation may prove useful for those who need to gather information in the field or display it to third parties, but Vadem's Clio (reviewed in issue 163) also has a swivel display and is capable of 65,000 colours rather than 256. Further, the display on the Clio is 9.4 inches on the diagonal rather than the 8.2 inches of the Izzi Swivel. As it only costs a few pounds more than the Izzi Swivel, it may be a better choice if you are in the market for a H/PC Pro-powered portable computer.

Sandra Vogel

Specifications
WinCE version 2.11 (Professional Edition), MIPS TX3922 processor running at 129MHz, 32MB RAM, 8.2-inch display 640 x 480 pixels at 256 colours, 1 x PC card slot, 1 x Compact Flash card slot, 1 x USB port, IrDA infra-red, 56Kbps internal modem, microphone and headphone sockets, VGA out (connector supplied), 1 x Serial port (connector supplied)

Other information
WinCE 2.11 (Professional Edition) includes the following software: Pocket Word, Pocket Excel, Pocket Access, Pocket PowerPoint, Pocket Internet Explorer, Inbox, Calendar, Tasks

PCPlus Verdict

SAMSUNG IZZI SWIVEL

✓FOR
- → Novel swivel display
- → Ultra small
- → Good keyboard

✗AGAINST
- → DSTN display is disappointing

Specification	8
Quality	8
Performance	7
Value for money	7
OVERALL	**7**

HARDWARE/SOFTWARE

CardScan Executive

PRICE £199 **EX VAT** £170 **SUPPLIER** Widget UK
PHONE 01438 818 818 **ONLINE** www.widget.co.uk

You'll never need to type in the details from a business card again

For many of us, meeting new people is a central part of working life. At the end of a meeting we can easily end up with a pile of business cards whose contents need to be transferred to our PC. Typing the information, while not exactly time consuming, can be a bore, so Corex has come up with the CardScan Executive to take the strain on your behalf.

Requirements
Pentium processor, 16MB RAM, Windows 95/98/NT, free USB or parallel port

Tested on
Carrera PIII 128MB RAM Win98 SE

The kit is a hardware/software combination. The hardware is the scanning unit itself. It's about the same size as a pile of six music CDs and it connects to your PC either through a USB or parallel port. The parallel connector is a through port so you can plug your printer in at the same time as the scanner. The software is a contact management tool called CardScan. This is preconfigured with a standard array of fields, and the details read from business cards are automatically fed into them. The software is not as sophisticated as third party address books, but if your needs are relatively simple it could suffice. You can, for example, group contacts into categories, and link into fax and e-mail software with a double click.

← The CardScan Executive is probably more of an executive toy than a real world tool, but it performs very well.

If you do want to get contacts details out of the CardScan software and into an altogether meatier address book or personal information manager, then the supplied version of Intellisync can be set to work with most PIMs and with EPOC, CE and Palm OS hand-helds. Synchronisation can be achieved in batches by clicking a button on the CardScan software window or, using a mode called AutoSync, as an automate`d process whenever a new business card is scanned.

The character recognition software that forms part of the CardScan setup is very effective. Our test cards were all read without any problems, e-mail and Web addresses were inserted into the correct fields on the CardScan software, and the kit even managed to read addresses cut out of letterheads as well as standard business cards.

While undoubtedly efficient, at £200 the CardScan Executive is certainly not an impulse buy. Still, if you've got room on your desk and a definite dislike for typing contact details, it is worth considering.

Sandra Vogel

PCPlus Verdict

CARDSCAN EXECUTIVE

☑ FOR	☒ AGAINST
→ OCR technology works well	→ It costs a lot less just to type the contact details yourself
→ Good basic address book software	

Specification 7
Quality 9
Performance 9
Value for money 7
OVERALL 8

GRAPHICS

Corel KnockOut 1.5

PRICE £234 **EX VAT** £199 **SUPPLIER** Corel
PHONE 01703 812755 (Channel Marketmakers)
ONLINE www.corel.com

Make graphics 'float' quickly and easily

If you look at the advertisements in magazines on virtually any other subject, you'll see objects – PCs, models, cans of dog food, apparently floating over the white page. These ads were constructed by 'knocking out' images of the computer, person or tin from its original background and using just the foreground object. Knocking out is a skilled and time-consuming job for a graphic artist, even with the latest graphics software on a powerful PC Corel's KnockOut aims to make it quick and easy.

Requirements
Pentium or higher processor (200MHz minimum), Win95/98 or NT4.0, 64MB (8x image size, RGB + Alpha), CD-ROM, SVGA 24-bit colour display.

Tested on
Athlon 750 with 64MB RAM, Win98 SE

It's a standalone application, into which you load the target picture. By defining two marquees, one entirely inside the image and the other outside, you can extract the part of the picture you want. The software determines which colours are part of the background and which are part of the foreground and makes transparent just the background ones.

← Define what's inside and outside the image you want and KnockOut does the time-consuming bits.

The space between the two marquees is called the transition area and can be a complex image, like long hair or fur. KnockOut looks through this area, finding all the relevant pixels and processing them. It does it very well, too. You may need to tidy up the result with a photo-editor, but you will still have saved a lot of time.

KnockOut itself provides a couple of useful tools for improving the extracted images. If it has got confused during the knocking out, you can inject pixels of colour, using the syringe tool, from other parts of an image into poorly coloured areas, before reprocessing.

The program can also handle transparent objects, like glasses or light bulbs. Here, you select individual pixels within the object, rather than defining an inside marquee. This too works well, as does knocking out shadows, which are treated as separate objects and retain their original level of transparency. KnockOut uses the alpha channel in modern graphic file formats to hold this information and can export to many popular formats.

The only drawback with KnockOut is its use of bitmap lines for drawing marquees. You can draw freehand, or point to point with straight lines, but this is still awkward compared with using Bezier curves, where you can adjust nodes and line shapes.

Even with its current tools, KnockOut 1.5 goes a long way to solving one of the few remaining labour-intensive tasks in graphics. It's pricey, though.

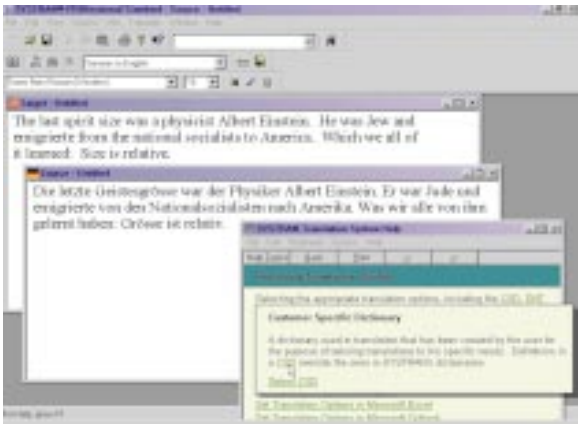
Simon Williams

PCPlus Verdict

COREL KNOCKOUT 1.5

☑ FOR	☒ AGAINST
→ Knockouts save time	→ Adjusting marquees is awkward
→ Handles shadows and images	→ Expensive
→ Can knock out through images	

Specification 7
Quality 6
Performance 9
Value for money 6
OVERALL 8



LANGUAGE TRANSLATOR

SysTran Professional

PRICE £152 **EX VAT** £129 **SUPPLIER** Sales Unlimited
PHONE 0207 828 1999 **ONLINE** www.systransoft.com
PUBLISHER SysTran

How accurately does SysTran translate your languages?

Ever wanted to swap sultry e-mails with a French Monsieur or Mademoiselle but you don't know your Oos from your la-las? Or logged on to an interesting-looking Web site only to discover that it's written entirely in Portuguese? Well, there are two solutions to the problem – either you can take a crash course in a handful of foreign languages or you can invest in a copy of the SysTran automatic translation software.

Requirements
Pentium 75MHz, Windows 95/98, NT4 (service pack 3), Windows 2000, 16Mb RAM, 50MB hard disk

Tested on
Pentium II 333MHz, 64MB RAM, Windows 2000

SysTran translates between English and French, German, Italian, Portuguese and Spanish. It can either be integrated into Microsoft applications such as Word or Excel or it can be used from within its own word processing environment. This supplies two windows – one for the original text and one for the translation.

←Systran's integrated environment lets you enter accented characters by pressing the INSERT key. Translation quality can be improved by creating custom dictionaries.

The software would be ideal for translating to and from a language with which you are least passingly familiar. You can let SysTran do the hard work and then make any fine adjustments yourself. Translating to a language that you don't know at all, however, requires a leap of faith. In order to check the accuracy of the software's translation you may, of course, get it to re-translate the translation back into English.

This is quite instructive. We found that the translation can be significantly better if the original is written in a terse and unambiguous style. Even so, in our tests, a few errors occurred in almost every translation. All the same, in most cases, it was possible to grasp the broad sense of the original even if some of the finer nuances were lost. Here, for example, is an English-to-French-to-English translation of a well-known nursery rhyme: Humpty Dumpty rested on a wall. Humpty Dumpty had a great fall. The horses of all the king and the men of all the king, could not still go up Humpty.

You will probably agree that, considering this has undergone two levels of translation the first two sentences remain remarkably faithful to the original. However, the mistranslation of the last sentence illustrates the subtle dangers of trusting the software to convey your meaning without first getting its translation checked by a native speaker!

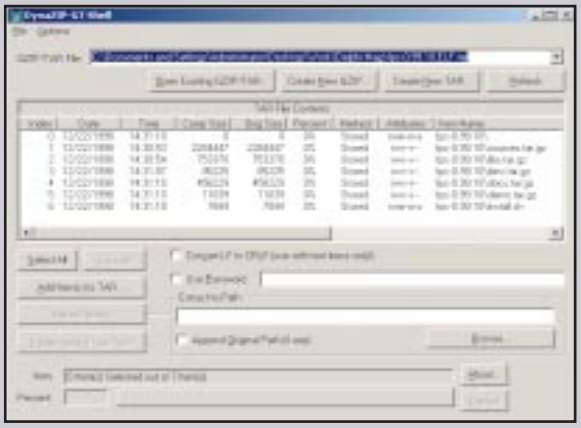
Huw Collingbourne

PCPlus Verdict

SYSTRAN PROFESSIONAL

☑FOR	☒AGAINST
→ Simple to use	→ No integration with WordPerfect or WordPro
→ Customisable	→ Some ambiguous translations

Specification	7
Quality	8
Performance	7
Value for money	8
OVERALL	**8**



TOOLKIT

DYNAZIP-GT from Inner Media

PRICE £210 **EX VAT** £179 **SUPPLIER** Grey Matter
PHONE 01364 654100 **BUY ONLINE** www.innermedia.com

Easily manipulate compressed Linux files

Inner Media is a company that, for some years, has specialised in the creation of tools that enable developers to manipulate ZIP files from within their own programs. With the recent huge increase in the popularity of Linux, and the consequent interest in cross-platform tools, it's become increasingly important for Windows developers to work not only with ZIP files, but also with TAR and GZIP files too – two file formats that are very popular in the UNIX/Linux world. If you're not familiar with these file formats, suffice it to say that the TAR file format can store multiple files, but only in an uncompressed form.

Requirements
Win95/98/NT 3.1, Pentium, 16MB memory, 20MB disk space

Tested on
Win2000, 500MHz Intel, 256MBytes RAM

Available on
CD-ROM or from www.innermedia.com

←The DynaZip-GT toolkit can be used to manipulate GZIP and TAR files and includes a number of sample applications that illustrate the use of the library.

The GZIP file format, on the other hand, represents a sort of simple-minded ZIP program; it can compress data, but only works with a single file! Put these two facts together, and it becomes obvious why UNIX/Linux programmers routinely wrap a bunch of files together into a single TAR file, and then compress the whole thing with GZIP.

Cygnus includes command line TAR and GZIP tools in its CygWIn package, but these are far from user-friendly.

Enter DynaZip-GT. This toolkit enables Windows developers to work with GZIP/TAR files regardless of which programming language they use. It includes a small DLL which can be called from Visual C++, Delphi, and so on, an ActiveX control for calling from Visual Basic, and there's even a 32-bit static link version of the code which can be linked right into a C/C++ program, thus eliminating the need for a separate DLL or OCX file altogether. There's support for both file-based and in-memory compression/decompression, and you can even compress/decompress from memory to memory in situations where a temporary file isn't required.

The product comes with excellent documentation in Adobe Acrobat format, numerous programming samples (including ASP), and you can even download a fully functional (no timeouts or 'crippled' features) version of the toolkit from the Inner Media Web site in order to do a proper evaluation before purchase. We applaud such an enlightened approach to the marketing of commercial software.

Dave Jewell

PCPlus Verdict

DYNAZIP-GT FROM INNER MEDIA

☑FOR	☒AGAINST
→ An efficient, language independent programmer's toolkit for working with GZIP and TAR files	→ Would be nice if registered purchasers could get the source code
	→ Quite expensive

Specification	9
Quality	8
Performance	8
Value for money	6
OVERALL	**8**

Come on, make some noise

Is your PC wired for digital sound? Tony Browne checks out ten next-generation cards

Sound is an integral part of your PC and, with the advent of technologies such as sampling and the playback of MP3 files and DVD movies, audio components are more important to a computer than they have ever been before. Fortunately, audio devices are moving towards a new, more powerful, digital era to comply with the demands of users.

Sound cards have recently changed from slower ISA slots to newer, faster PCI ones. This is important because PCI cards are fully plug-and-play compliant so they are easier to install and they place less strain on the resources of your PC. Devices such as the original Creative SoundBlaster Live! card were launched with as much processing power as a Pentium 133-powered PC. This means that your processor can concentrate on its own work, instead of being slowed down while processing audio information.

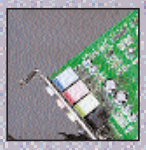
Sound card buyers seem to be split into three distinct camps these days. The first group includes users who are happy with general-purpose sound devices. These are often cheap ISA SoundBlaster-compatible cards or sound chipsets that are built-in to motherboards. These items are good enough to play CDs and multimedia titles.

The second group, gamers, are more discerning: Ordinary cards just won't do because these players love sound effects and they need real-life 3D positional sound in order to hear where their opponent's next rocket is coming from. Games demand support for 3D audio systems such as EAX or A3D, and work best when a PC is equipped with two pairs of speakers which need two separate output sockets. These features are rarely seen on cheaper or integrated cards.

The third group is musicians. In the early Nineties they used specialist machines such as the Atari ST. These computers have all but died a death and have been replaced by IBM-compatibles with decent sound processors and clever sequencing software. For the musician, sound cards have two purposes: they can be used to provide sounds from the built-in samples already stored in memory, or they can add sounds by recording them directly to the card such as the Guillemot ISIS. These cards are often expensive and not supplied as standard equipment by PC manufacturers.

There are many different sound card manufacturers and several models may suit your needs, so which one should you choose? To find your perfect audio solution, read on...

BUSBY
4 Channel
SPDIF 3D PCI
80



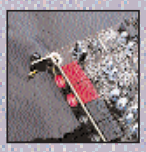
Absolute
Multimedia
Outrageous
3D Sound
80

Creative
SoundBlaster
Live! Player
1024
81

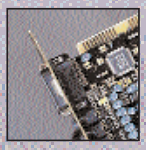
Creative
SoundBlaster
Live! Platinum
81

Guillemot Maxi
Studio ISIS
84

Guillemot
Maxi Sound
Fortissimo
84



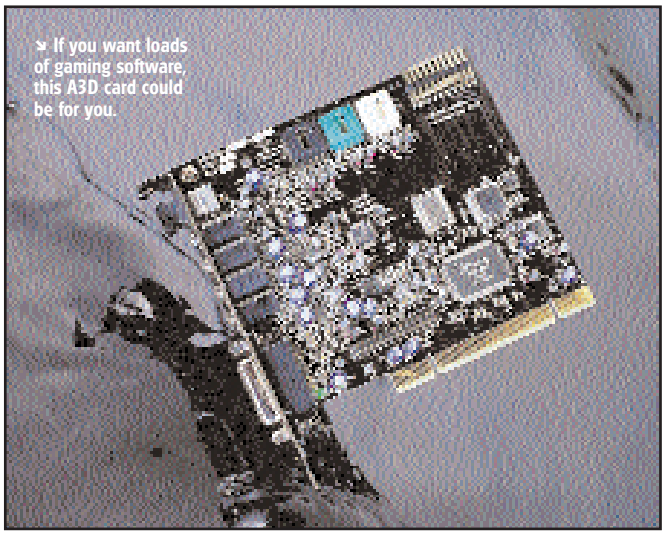
Terratec Audio
System EWS
Digital
88



Terratec DMX
Advanced Audio
Accelerator
88

Turtle Beach
Montego II Plus
89

Trust Sound
Expert Digital 4D
89



If you want loads of gaming software, this A3D card could be for you.

Absolute Multimedia Outrageous 3D Sound

PRICE £50 **EX VAT** £42 **SUPPLIER** Absolute
PHONE 02635 278 587 **ONLINE** www.absolute.com

There's loads of free leisure software with this card, so is this the best solution for gamers?

System requirements Win95/98/NT, P90 or higher, 16MB RAM, 24MB hard drive
Technical specifications Aureal Vortex 8830, A3D V2.0
Extras Four games, software DVD player

The Absolute Multimedia Outrageous 3D Sound is the company's highest specification card and an Aureal Vortex 8830 chip powers this device.

On-board connectors include sockets for connecting TAD, CD and Auxiliary devices. At the rear you'll find the usual suspects of SPDIF socket, stereo speaker sockets, microphone/line in plus a MIDI/Game pad port. This card will happily play games that use Microsoft's DirectSound and DirectSound 3D standard. It will even play games in DOS but it won't play EAX-equipped software. This is a shame if you're a true gamer but the latest version of A3D technology should keep you happy.

Installation of this device is easy, even though there are no proper printed instructions supplied. Fortunately, there is a copy on the CD-ROM. On a more positive note, you can't argue with a three-year warranty.

When playing Quake III with the sound turned right up, the sound quality was average. The bass sounded meaty, but high frequency sounds weren't so clear. CD playback was disappointing, too, with all the songs sounding a bit flat.

DVD video playback was acceptable and sound clarity through all of the five channels was okay. On the CD, you'll find a copy of WinDVD for playing DVD movies.

When you look at the software bundle it's easy to see where Absolute feel its potential customers lie. If you like games, you'll be pleased to find that the box is filled with such goodies as Descent 3, Half Life, Thief and Heretic II – these should keep you up till the early hours. Thanks to a free voucher, you can also choose one other free gaming title.

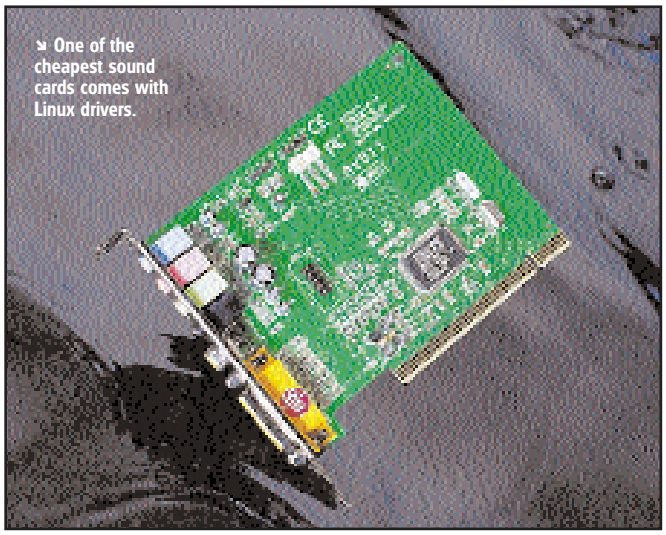
If you're short on games then you can't go wrong with this card, thanks to the A3D V2 compatibility and free software. For true audio buffs we would either go for the Creative Live! Player 1024 or the Guillemot Fortissimo. Both sound better and have software for the musician as well as gamer.

PCPlus Verdict

ABSOLUTE MULTIMEDIA OUTRAGEOUS 3D SOUND

✓FOR	✗ AGAINST
→ Loads of games	→ Technology getting old
→ Good value for money	→ Sound quality not brilliant

Specification	7
Quality	6
Performance	7
Value for money	8
OVERALL	**7**



One of the cheapest sound cards comes with Linux drivers.

BUSBY 4 Channel SPDIF 3D PCI

PRICE £22 **EX VAT** £19 **SUPPLIER** BUSBY
PHONE 01732 350 666 **ONLINE** www.busby.co.uk

The days of cheap, low specification cards may end soon – especially if BUSBY has its way

System requirements P166+, Win95/98/NT 4.0, 32MB
Technical specifications OPL3 FM synthesiser, 32-bit PCI bus master, built-in 16-bit CODEC
Extras Linux drivers

BUSBY derives its name from the fact that it usually produces USB devices (obviously not the case here). At the rear of this device, you'll find two speaker sockets, plus line in and microphone connectors. For easy identification, some of these items are coloured in pastel shades of blue, pink and green. Next to these sockets you'll find a SPDIF socket and a MIDI/Joystick port. On the card itself there is a socket for CD audio but no cable is supplied.

Installing this card into our test PC didn't cause any undue difficulties. The card was readily recognised by Windows 98 and the drivers were read in straight away. Linux drivers on CD are a welcome addition – companies such as Creative, Guillemot and Terratec should take note.

Technical highlights for this device include support for Microsoft's DirectSound3D and Aureal A3D V1.0. It will also play DOS-based games and it is fully compatible with Microsoft's DirectMusic API.

While playing Quake III, we were impressed to find that this inexpensive card could handle the maximum sound setting. The only downside here was that the game paused whenever the player changed direction rapidly. This indicates high CPU usage – not surprising on a cheaper card.

Whilst playing CDs, the sound quality was crisp and clean but MIDI playback was a bit slow while playing our test sequence. DVD playback was good, with voices still easily being heard when background sound effects were loud.

Being a budget item, you only get one piece of software with this card: AudioRack, a common or garden media player that plays MIDI/Wave, CD and MP3 files. There are no games or MIDI sequencing software. Furthermore, the instruction booklet supplied with this card is sparse.

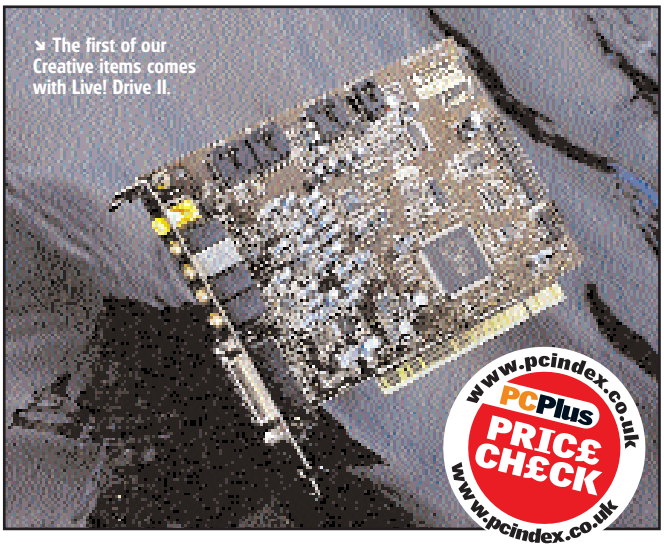
This is a cheap card which, although it does have some features that low-end users need, on balance, we would not recommend above the Guillemot Fortissimo or Creative SoundBlaster Live! 1024 cards.

PCPlus Verdict

BUSBY 4 CHANNEL SPDIF 3D PCI

✓FOR	✗ AGAINST
→ Great value for money	→ No extra software
→ Comes with a SPDIF connector	→ Instructions are a bit sparse

Specification	6
Quality	6
Performance	6
Value for money	8
OVERALL	**6**



↘ The first of our Creative items comes with Live! Drive II.

Creative SoundBlaster Live! Platinum

PC INDEX BEST PRICE £140 **PRICE** £179 **EX VAT** £152
SUPPLIER Creative Labs **ONLINE** www.europe.creative.com

The new Live! Drive II makes the SoundBlaster Platinum a great choice

System requirements Pentium 133MHz or faster, 16MB system RAM, Win95/98/NT 4.0
Technical specifications EMU 1010K1 sound processor, 64 hardware voices, 2 x SPDIF sockets plus optical in/out
Extras Comes with all necessary cabling, two games, music software, microphone

One of the main differences between this card and the original SoundBlaster Live! is that the Platinum ships without a daughter board. This isn't needed because of the new Live! Drive II, a great addition that fits into a spare 5.25-inch slot at the front of your PC. From here you can easily access the SPDIF sockets and optical inputs and outputs so you can hook the card up to various musical instruments.

This card itself is powered by an EMU 1010K1 chip that can handle 64 polyphonic voices or up to 1,024 voices, if you use the right sequencing software. Thanks to the built-in effects processor, the SoundBlaster Live! Platinum also has the ability to create sound effects in real time. Musicians may also want to take note that they can transfer up to 32MB of samples to the SoundBlaster Live! Platinum. You will also find the usual array of SPDIF/MIDI sockets, duo speaker connectors and TAD, AUX and CD connectors located in easy to reach positions.

There were no problems either fitting this card or installing the driver software. Playing our sample benchmark CD/MP3 files was fine – all the samples were clear and the bass rumbled our speaker set when Quake III was played at its highest setting. Movie buffs and MIDI fans may be pleased to know that sound quality, especially when playing notes at the higher end of the scale, was as clear as a bell.

The SoundBlaster Live! Platinum probably has the biggest software bundle ever seen with a sound card. For the musically inclined there are copies of Cubasis VST, and Mixman Studio. Other extras include two games (Alien vs Predator and Rollcage), a microphone and all the cables you'll ever need, including a digital CD cable.

All-in-all, this audio adaptor is an impressive piece of kit and compares well with the Guillemot ISIS and Terratec EWS Digital.

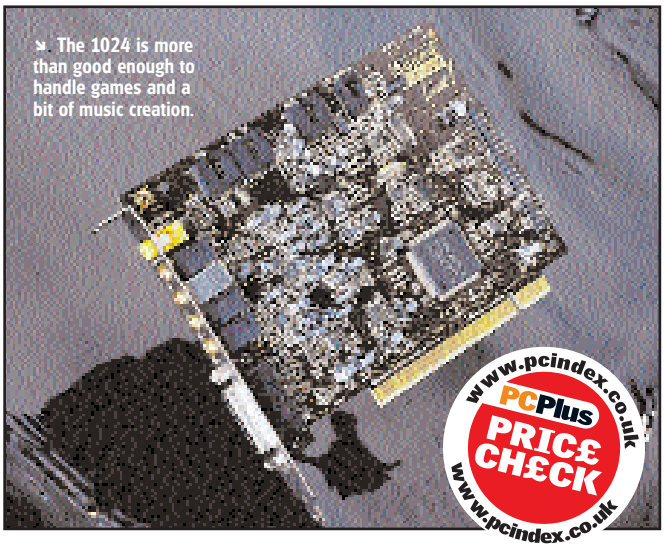
PCPlus Verdict

CREATIVE SOUNDBLASTER LIVE! PLATINUM

☑FOR
- → One of the best software bundles ever seen with a sound card
- → Live! Drive

☒AGAINST
- → Does not support rival A3D standard

Specification	9
Quality	9
Performance	8
Value for money	8
OVERALL	**9**



↘ The 1024 is more than good enough to handle games and a bit of music creation.

Creative SoundBlaster Live! Player 1024

PC INDEX BEST PRICE £39 **PRICE** £69 **EX VAT** £59
SUPPLIER Creative Labs **ONLINE** www.europe.creative.com

The cheapest SoundBlaster is feature-packed and good value to boot

System requirements Pentium 133MHz or faster, 16MB system RAM, Win95/98/NT 4.0
Technical specifications EMU 1010K1 sound processor, 64 hardware voices,
Extras A game, software DVD player and music software

This new card is labelled as the 'Ultimate gaming, MP3, Internet and DVD audio solution'. Why? Well, thanks to Creative's generosity, you can now turn CDs into MP3 files with support for environmental audio.

Internet-wise you can make computer-to-computer calls with the help of the supplied PC phone software. Creative has even managed to bundle a copy of that popular shoot-em up, Aliens vs Predator. Furthermore, you also get a software-based DVD player. How's that for a software bundle?

The Live! Player 1024 can handle up to 1,024 voices. This is thanks to E-MU Systems now famous EMU10K1 sound engine. This chip also has support for 64 hardware voices and real-time effects such as reverb, chorus and pitch sifting. Although this card supports Creative's EAX environmental sound technology, Direct Sound and DirectSound 3D, it isn't compatible with DirectMusic and Aureal's A3D.

There is a socket for a CD SPDIF equipped device as well as CD in, TAD and AUX connectors. At the rear of the card, you'll find the usual selection of twin speaker output sockets, line in, microphone and who could forget the very useful MIDI/joystick port and digital SPDIF sockets?

In our tests, this version of the SoundBlaster Live! did extremely well. MP3, DVD and CD playback were clear and even, right through the audio spectrum. We were amazed with how well the card coped with Quake III's highest audio setting and our MIDI playback file.

As this card is the successor to the SoundBlaster Live! Value, it hasn't got all the features that the Platinum has so, unfortunately, this card misses out on the great Live! Drive II and other minor details such as the stand microphone. We wouldn't worry about this because, in its current configuration, the Player 1024 is more than good enough to handle games and the odd bit of music creation.

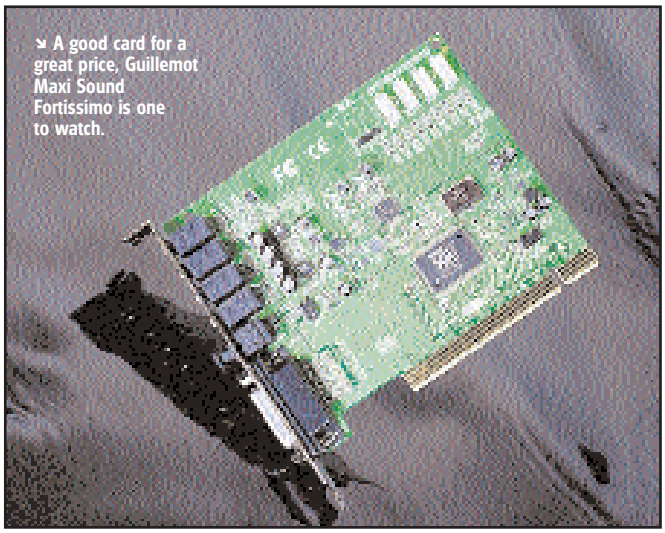
PCPlus Verdict

CREATIVE SOUNDBLASTER LIVE! PLAYER

☑FOR
- → Bundled software
- → Great value

☒AGAINST
- → Serious musicians should go for the SB Live! Platinum

Specification	8
Quality	8
Performance	8
Value for money	8
OVERALL	**8**



↘ A good card for a great price, Guillemot Maxi Sound Fortissimo is one to watch.

Guillemot Maxi Sound Fortissimo

PRICE £40 **EX VAT** £34 **SUPPLIER** Guillemot UK
PHONE 020 8686 5600 **ONLINE** www.guillemot.com

This good value card from Guillemot is high on features and low on price

System requirements Pentium 233 chip or higher, PCI slot, 16MB RAM, Win95/98
Technical specifications Yamaha YMF744 chipset, 64 voices, supports EAX and A3D
Extras Acid DJ on CD

The Guillemot Maxi Sound Fortissimo is a budget four-channel card, which is powered by the Yamaha YMF744 audio engine or chipset. This card supports standards such as Microsoft's latest API, DirectMusic, DirectSound/3D, A3D, EAX plus the Sensaura's 3D positional system. Technical highlights include 64 voices in hardware, 676 built-in instrument sounds and the ability to produce reverb plus chorus effects.

The board itself isn't very big; there are the normal four connectors on the back for two speakers, line in and microphone. Surprisingly at this price bracket, there is also a SPDIF connector. Performance was good for a card in the value sector of the market. During DVD movie playback and WAV files, the sound was crisp and clear. When playing Quake III, there were no apparent problems, even when we cranked up the volume and the sound quality settings were pumped up to maximum.

Sound performance wasn't too bad – when it came to playing CDs, the top end was a bit of a muddle but bass was well represented.

This card comes with Acid DJ music editing software which enables the more musical among you to mix and match samples and arrange them into something that sounds like the latest number one single. It also comes with media studio station software which enables the playback of certain files such as CD tracks and WAV files.

The only downside of this card is the documentation. This only consists of a quick install guide. Although there is a proper manual on the CD, you'll have to waste your own ink, paper and time printing it out.

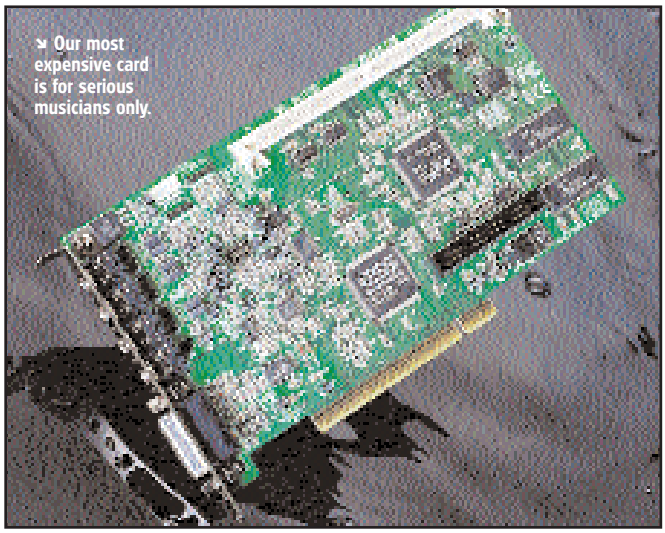
To conclude, this card would make a much better addition to your PC than the card you'll have got as standard. It has a good range of features such as support for the latest gaming standards. You also get surround sound and a digital output. Not bad for a £40 card. Bravo Guillemot.

PCPlus Verdict

GUILLEMOT MAXI SOUND FORTISSIMO

✓FOR	✗ AGAINST
→ Supports popular sound standards	→ No games supplied
→ Low cost	→ Instructions aren't the best ever

Specification	7
Quality	7
Performance	8
Value for money	10
OVERALL	**8**



↘ Our most expensive card is for serious musicians only.

Guillemot Maxi Studio ISIS

PRICE £250 **EX VAT** £213 **SUPPLIER** Guillemot UK
PHONE 01706 228 039 **ONLINE** www.guillemot.co.uk

The ISIS comes with a main rack with loads of connections making a great card for music makers

System requirements Pentium 166MHz and higher, PCI slot, 32MB RAM Win95/98
Technical specifications ESS Maestro chipset, DSP (Digital Signal Processor), built-in synthesiser, 3 EGs (Envelope Generators), 4MB RAM of high-quality samples
Extras External rack

Guillemot's Maxi Studio ISIS is aimed at serious musicians. Inside the box you'll find a large sound card and a digital input/output card just like the other devices featured here. However, the difference is, the ISIS goes one better with a MIDI controller box that enables you to connect and control various MIDI-compliant devices such as keyboards and drum machines via your ISIS card and PC. Luckily, Guillemot has included a quick installation guide and there's also a big user manual.

Physically, the appearance of the ISIS is similar to the Terratec DMX card. There are plenty of connectors and these include two sockets for surround sound, game/MIDI port and line and microphone in. Furthermore, there are metal pin connectors for two types of CD devices, Auxiliary in, line in/out and surround sound but no TAD or video connectors. You can, however, add up to 36MB of RAM to the 4MB instrument samples that come as standard via a SIMM memory slot.

The technical specifications are impressive: this card is one of the few here to contain a Digital Sound Processing (DSP) chip, which helps the card produce real-time special effects such as echo, pitch shifting, chorus and reverb. The ISIS can also handle 64 voices in hardware.

The software bundle is first rate, and it includes Logic Audio Pro ISIS, which is a digital multi-channel audio/MIDI recording system. You also get Acid DJ, Cool Edit Pro (a ten-track wave file editor), and loads of sequencing software demos from the likes of Steinberg and Cakewalk.

The ISIS did well in all of our tests, providing excellent sound in the high frequencies. Also, the fact that it's compatible with A3D and EAX should be a massive bonus to gamers.

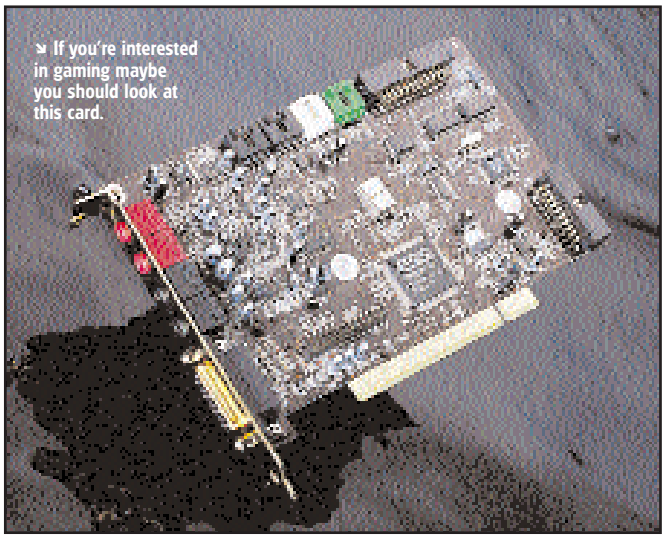
This card beats Terratec's EWS Digital and Creative's Platinum products if you seriously want to make your own music, but it would have been nice to have one of the sequencing software demos as a full program.

PCPlus Verdict

GUILLEMOT MAXI STUDIO ISIS

✓FOR	✗ AGAINST
→ Bundled software	→ Price makes it for serious musicians only
→ Comes with daughter board and main rack	

Specification	9
Quality	8
Performance	8
Value for money	7
OVERALL	**8**



If you're interested in gaming maybe you should look at this card.

Terratec DMX Advanced Audio Accelerator

PRICE £119 **EX VAT** £102 **SUPPLIER** Digiteq
PHONE 08709 010 021 **ONLINE** www.digitequk.com

This card comes with no games, so why does it get such a high score?

System requirements Pentium 166 or faster, 16MB RAM, 16MB hard disk, Win95/98/NT 4.0
Technical specifications Canyon3D Engine, 64 voices, DirectSound, DirectSound 3D, A3D, EAX
Extras Daughter board

The Terratec DMX is definitely for you if you want a sound card that supports nearly all of the current sound standards. Not only does it support the usual Microsoft pairing of DirectSound and DirectSound 3D (DirectMusic is on its way), it is also compatible with A3D, EAX and Sensaura 3D. The Canyon3D engine may not be the most famous ever, but it can handle up to 64 voices in hardware and sample at 48KHz.

The look of the main card reminds us much of the Guillemot ISIS. The usual silver has now been replaced by gold, making this look a classy item. The two speaker connectors (enabling stereo surround sound), line in and microphone sockets aren't gold plated but they are on a gold backing plate. There is also the standard midi and joystick port. At the top of the card are four connectors for CD, TAD and AUX. If you're wondering what happened to the other one, it's another CD socket. The daughter board contains connectors for optical digital input and output.

The installation of this card went okay, but the machine had to be restarted three times because it kept crashing during installation of the driver software. The installation of the rest of the supplied software went without a hitch. Most of the supplied documentation looked great until we actually came to read it – it's all in German.

During testing, CD, MP3 and MIDI playback was great, especially in the middle range. This card, which is aimed at the gaming market, coped with Quake III easily with no loss of frame rate and the sound effects were extremely clear. The Terratec DMX Advanced Audio Accelerator comes with a two-year guarantee. Although sound cards are usually reliable, this gives increased piece of mind.

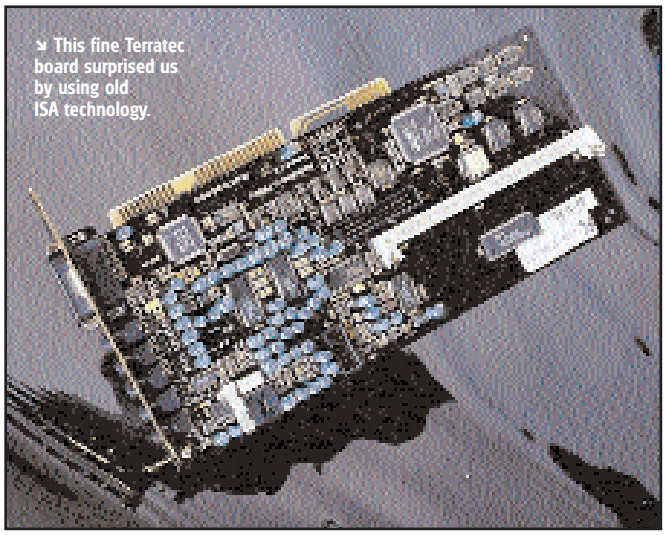
This is a great card for gamers who love a great blast as there are enough standards supported here to sink a battleship. Ironically, Terratec never thought to supply a game or any sequencing programs.

PCPlus Verdict

TERRATEC DMX ADVANCED AUDIO ACCELERATOR

✓FOR	✗ AGAINST
→ Supports the latest standards	→ Quite expensive
→ Comes with wavetable daughter board	→ No games supplied

Specification	9
Quality	8
Performance	8
Value for money	7
OVERALL	**9**



This fine Terratec board surprised us by using old ISA technology.

Terratec Audio System EWS Digital

PRICE £149 **EX VAT** £127 **SUPPLIER** Digiteq
PHONE 08709 010 021 **ONLINE** www.digitequk.com

Terratec's card is similar to the Guillemot ISIS but there are differences for musicians to note

System requirements AMD or Pentium processor, 16MB RAM, CD-ROM
Technical specifications 64 voices, SPDIF input and output, Duplex MIDI
Extras: Daughter board

The new Terratec EWS Digital audio adaptor is aimed at those who are serious about music creation. It looks like the Guillemot ISIS also reviewed in this lab test because both items are half length boards that have a propriety SIMM memory socket. This time around, the EWS Digital can handle up to 64MB as opposed to 32MB on the ISIS. However, both cards seem to share the same DREAM RISC-based DSP (Digital Sound Processing) chip.

The connectors are poorly labelled. The mic is obvious enough but the next two are etched with L-2 and L-1. The connectors for items like TAD, AUX and video-in aren't well labelled, either.

The documentation that comes with this card is comprehensive and one thing that caught our eye is a great guide to MIDI music on the PC.

Installing the card wasn't hard, but when it came to adding it to our test system we got a bit of a shock: Terratec is alone here by offering a card that uses the older ISA slot. This could cause problems because ISA slots are now more or less outlawed by the powers that be in PC design. It also means that this card is incompatible with lots of modern motherboards. So if you're interested in this card, make sure you have one of these slots before you buy it.

Music fans will be pleased to hear that this card comes with 64 note polyphony capabilities. There is a Dream DSP chip that allows for effects like reverb and chorus. Although this card also supports the now familiar DirectSound/DirectSound 3D system and MS DirectMusic, it doesn't support A3D. Testing the card produced no dramas – the card was easily recognised by the computer and, once installed, all the sample audio clips sounded fine. Quake III on the high setting sounded okay, MIDI playback was fine and tasks such as MP3 and DVD playback were handled with aplomb.

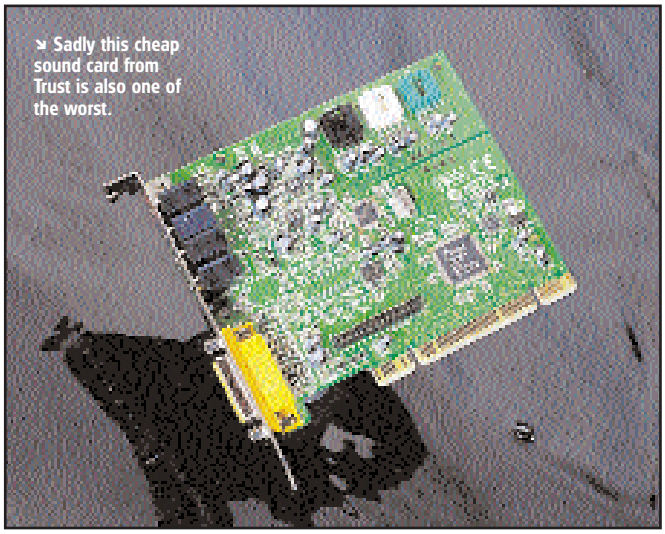
This card causes us a dilemma: it is similar to the Guillemot ISIS but it does without the main rack, PCI and it is £100 cheaper. We would have to go for the ISIS but the EWS is still a considerable card.

PCPlus Verdict

TERRATEC AUDIO SYSTEM EWS DIGITAL

✓FOR	✗ AGAINST
→ Powerful solution for musicians	→ Uses old ISA technology
	→ No leisure software

Specification	8
Quality	8
Performance	8
Value for money	8
OVERALL	**8**



↘ Sadly this cheap sound card from Trust is also one of the worst.

Trust Sound Expert Digital 4D

PRICE £30 **EX VAT** £25 **SUPPLIER** Trust
ONLINE www.trust.com

The inexpensive Trust Sound Expert falls down in a few important areas

System requirements P166 or higher, Win95, 32MB RAM, 60MB hard drive, DirectX 6.0
Technical specifications PCI full duplex, compatible with DirectSound 3D, EAX and Q-Sound, AC-3 and Q-Sound processor with 3D reverb, MPU-401 compatible MIDI interface, DirectX acclerator **Extras** CD cable

Trust is a respectable multimedia company who manufactures lots of products, much like Creative and Diamond. As you would expect from any modern sound card (except Terratec's EWS Digital) this device is PCI-based, using a Trident chipset. The Sound Expert Digital 4D supports most of the popular audio standards around today such as DirectSound 3D, EAX and QSound. On the top right of the card you'll see three coloured connectors. These enable the addition of a CD cable, auxiliary cable and a TAD cable to connect the sound card to a modem.

At the rear of the audio adaptor you'll find two speaker sockets and these enable two sets of speakers to be plugged in for surround sound effects while playing games and listening to DVD video soundtracks.

Installing the card into our test system was a simple task but some better documentation would have been a help. The two small booklets supplied are a bit thin on information. As with most of the equipment we see these days, things are better explained in the manual that is supplied on the CD-ROM. One point to note from this documentation is that the Yamaha synthesizer software doesn't work with Cyrix-based machines.

On the disk there are drivers for Win98/95/NT 4.0. In the applications folder there is some software called CleftStudio 3.0. This basically is a fancy CD, WAV and MIDI file player.

In testing, this card provided reasonable results for a card that comes from the lower end of the price range. The audio playback for CD tracks, MP3 files and during the chosen DVD movie was muddled. Changing the speaker settings to four speakers instead of two solved this. This card is poor for gamers. It doesn't support A3D and nor would it play Quake III at the highest sound setting.

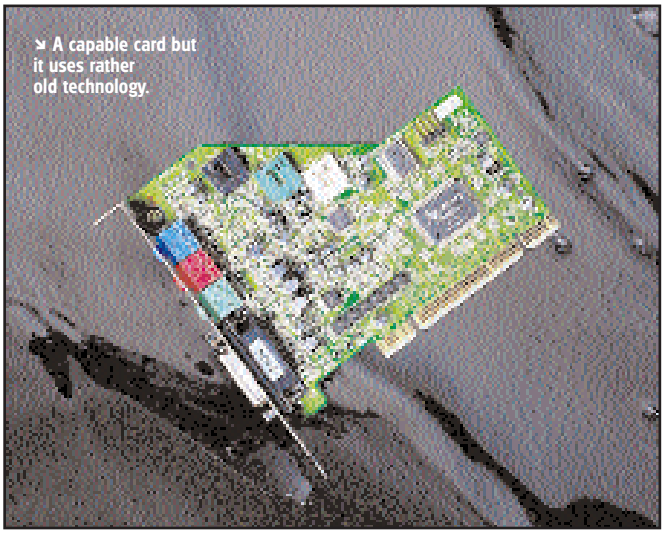
If you have an aging ISA card that desperately needs replacing, you could buy the Trust Sound Expert but there are a lot better budget sound cards on the market. Creative, BUSBY and Guillemot make them and we would suggest that you pay that little bit more.

PCPlus Verdict

TRUST SOUND EXPERT DIGITAL 4D

✓FOR	✗AGAINST
→ Cheap	→ Poor manual
→ Easy to install	→ No SPDIF connector

Specification	7
Quality	6
Performance	6
Value for money	8
OVERALL	**5**



↘ A capable card but it uses rather old technology.

Turtle Beach Montego II Plus

PRICE £129 **EX VAT** £110 **SUPPLIER** Etcetera
PHONE 01706 228039 **ONLINE** www.tbeach.com

How does the updated card from Turtle Beach compare with its rivals from Guillemot and Creative?

System requirements Win95/98/NT 4.0, 75MHz Pentium, 16MB RAM, 12MB hard drive
Technical specifications A3D 2.0 Interactive Sound 320-voice advanced wavetable synthesis (64 hardware + 256 accelerated software) with 4MB
Extras Daughter board, AudioStation and MIDI Orchestrator Plus software

Turtle Beach is a division of Voyetra, the company that produces sequencing software. The name may sound funny but don't laugh, this company has produced some great sounding audio cards over the last few years.

However, the technical specifications of this device may have been impressive a few months ago but now they're not so great. For example, this card may have the latest A3D chipset – version 2.0 but 320 voices using wavetable synthesis isn't impressive when you consider the SoundBlaster Live! has 1024 and it costs half the price of the Montego II Plus.

The daughter board also isn't much when compared directly to the efforts of Terratec and Guillemot. All you get are two in/out SPDIF sockets, two coaxial in/outputs and a socket for another speaker. The latter is done because the design of the original card is so old that two speakers sockets designs weren't around.

Testing the card was a bit of a disappointment, even though the card managed to perform all the tasks we set it. Although it managed to produce a decent audio performance in the Quake III highest setting test, the playback of MP3, DVD and MIDI files was poor – the sound was rather flat and we could only give it an average score here.

The only software applications you receive are two of Voyetra's own products. AudioStation enables you to play MIDI, WAV and CD tracks whilst MIDI Orchestrator Plus, a MIDI sequencer, lets you compose MIDI tracks. That's your lot, so this card clearly isn't for gamers.

One thing that is great about the Montego II Plus is that it has some decent instructions. Now we come to that important question: would we recommend this card? In short we have to say no. This card may have many features but it's a bit long in the tooth. Go for the Terratec pairing or the Creative SoundBlaster Live! Platinum. There are much better cards that cost around the same price.

PCPlus Verdict

TURTLE BEACH MONTEGO II PLUS

✓FOR	✗AGAINST
→ Latest A3D chipset	→ Old card and technology
→ Daughter board extension	→ Other cards sound better and cost the same

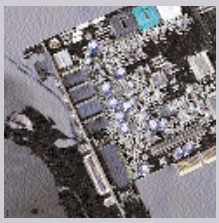
Specification	7
Quality	8
Performance	7
Value for money	6
OVERALL	**6**

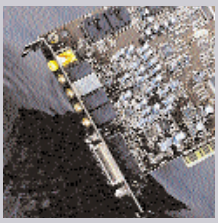
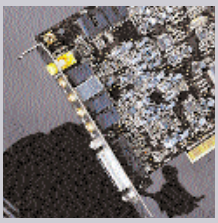
Sound cards at-a-glance

Want to buy one of these cards? Here are the vital specifications you need before you part with your hard-earned cash

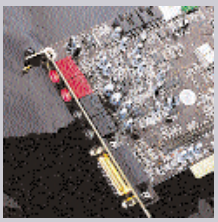
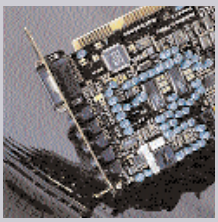
GLOSSARY

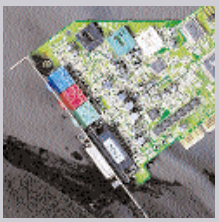
- A3D Hardware 3D sound standard, designed by Aureal DirectSound 3D Microsoft's software standard for creating 3D sound in games
- EAX Environmental Audio Extension - Creative's hardware 3D sound standard
- MIDI Musical Instrument Digital Interface - a standard used on electronic musical instruments and sound cards
- SPDIF Sony/Phillips Digital Interface - digital method for transferringmusic
- TAD Connector to an internal modem with voice capabilities




CONTACTS					
Supplier	**Absolute**	**BUSBY**	**Creative Labs**	**Creative Labs**	**Guillemot UK**
Model	Outrageous 3D Sound	4 Channel SPDIF 3D PCI	SoundBlaster Live! Platinum	SoundBlaster Live! Player 1024	Maxi Sound Fortissimo
Price VAT	£50	£22	£179	£69	£40
Price ex VAT	£42	£19	£152	£59	£34
Telephone	02635 278 587	01732 350 666	None	None	0208 686 5600
Web address	www.absolute.com	www.busby.co.uk	www.europe.creative.com	www.europe.creative.com	www.guillemot.co.uk
SPECIFICATIONS					
PCI/ISA	PCI	PCI	PCI	PCI	PCI
Sound chip	Aureal Vortex 8830	OPL3 FM synthesiser	EMU 1010K1	EMU 1010K1	Yamaha YMF744 chipset
Compatible with	A3D V.2 DirectSound/3D	A3D DirectSound/3D	EAX DirectSound/3D	EAX DirectSound/3D	EAX A3D DirectSound/3D
Extras	4 Games	Linux drivers	Live! Drive II, loads of software	Loads of software	Acid DJ
VERDICT	7	6	9	8	8



CONTACTS					
Supplier	**Guillemot UK**	**Terratec**	**Terratec**	**Trust**	**Turtle Beach**
Model	Maxi Studio ISIS	DMX Accelerator	Audio System EWS Digital	Sound Expert Digital 4D	Montego II Plus
Price VAT	£250	£119	£149	£30	£129
Price ex VAT	£213	£102	£127	£25	£110
Telephone	0208 686 5600	08709 010 021	08709 010 021	0800 328 0261	01706 228 039
Web address	www.guillemot.co.uk	www.digitequk.com	www.digitequk.com	www.trust.com	www.tbeach.com
SPECIFICATIONS					
PCI/ISA	PCI	PCI	ISA	PCI	PCI
Sound chip	ESS Maestro	Canyon3D Engine	ESS Maestro	Trident chipset	Aureal A3D
Compatible with	EAX A3D DirectSound/3D	EAX A3D DirectSound/ 3D Sensaura 3D	DirectMusic DirectSound/3D	DirectSound 3D, EAX and QSound	A3D V2 DirectSound 3D
Extras	MIDI Rack Acid DJ	Daughter board software demos	Daughter board	None	Daughter board
VERDICT	8	9	8	5	6

PCPlus VERDICT

So who would want to upgrade a sound card? Will going digital really make that much of a difference to your overall sound quality. We think so...

Analysis

HOW WE DID OUR TESTS

We tested the sound cards to see how they performed in everyday situations

Testing sound cards can be seen as a bit of a black art. Unlike a video card (which we'll be looking at next month), sound cards don't have massive amounts of benchmarking software written for them. This is why we decided to come up with some real-life tests for all the cards to undergo.

Many readers of this Lab Test will be avid game players, so they'll want to know how these cards handle a third person game. To test this we loaded up Quake III, and cranked the sound up to its highest level. We played a demo, listening to how well sampled sounds were played back, especially those heavy bass rocket sounds and clipped snippets of information from your section commander.

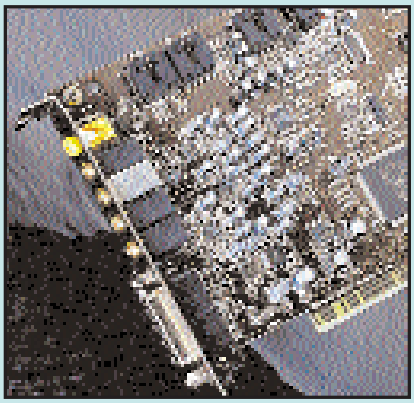
DVD has become more mainstream in the last year and now sound cards are often asked to handle films with Dolby surround sound. This means that they have to process sound from the left, right, rear, centre and front. The benefit of this is that film sound effects sound so much better: imagine helicopters and cop car chases with Doppler effects panning around you. Sound track songs also become more clarified. We played a DVD film to see how the audio tracks sounded and if the CPU slowed down our test system.

One of the more popular playback jobs of a sound card is playing back audio files. These include MIDI samples, CD tracks, MP3 and WAV files. To see how our competitors coped, we played some sample CD songs which focused on mid-range and high frequencies. We also played back MIDI and MP3 files using a sequencer and an MP3 player.

To get the best out of your sound card – whatever your interests may be – you'll need a decent set of speakers. To get the best sound reproduction we used a five-piece set, which comprised four satellites and a subwoofer. This set up ensures that heavy bass and high treble effects can be heard to the best of the tester's ability.

BEST IN TEST

Creative SoundBlaster Live! Platinum



↑A high specification card with lots of software at a good price. It's a winner.

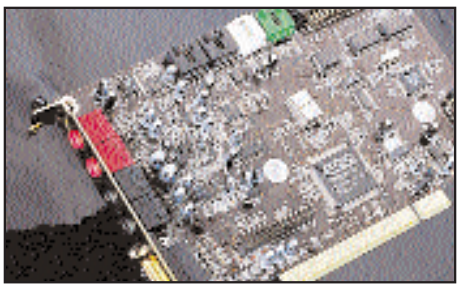
PC INDEX BEST PRICE £140 **PRICE** £179 **EX VAT** £152
SUPPLIER Creative Labs **ONLINE** www.europe.creative.com

The Creative SoundBlaster Live! Platinum card may not have the main rack of the Guillemot ISIS, the DSP dream chip found on the EWS Digital or the impressive Canyon 3D sound chip found on the Terratec DMX Audio Accelerator, but this card doesn't need them. This card has an EMU 1010K1 chip that can handle 64 polyphonic voices or up to 1,024 voices. Thanks to the built-in effects processor, the SoundBlaster Live! Platinum also has the ability to create sound effects in real-time.

With its neat Live! Drive II, you can hook the card up to various musical instruments. This great addition fits into a spare 5.25-inch slot at the front of your PC. From here you can easily access the SPDIF sockets plus optical inputs and outputs with resorting to fiddling with bottom rear of your PC. What's more, this card comes with loads of sequencing software and games. Who could ask for anything more?

RECOMMENDED

Terratec DMX Advanced Audio Accelerator



PRICE £119 **EX VAT** £102 **SUPPLIER** Digiteq
PHONE 08709 010 021 **ONLINE** www.terratec.net

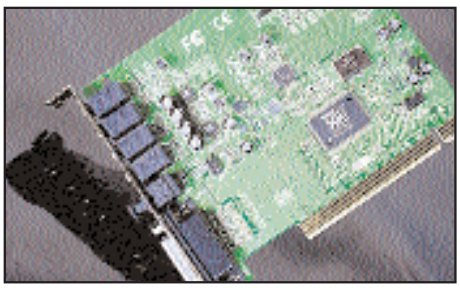
It was a hard choosing the winner of this category because many of the cards featured were valid contenders. In the end, we went for a Terratec DMX Audio Accelerator. Terratec may not be a big name, but it soon will be if the cards in this lab test are anything to go by. We were impressed by the Canyon3D engine which can handle up to 64 voices in hardware and sample at 48KHz – in other words, near CD quality.

Not only does it support the DirectSound/3D APIs but DirectMusic support is coming soon, making it attractive to musicians as well as gamers. This device is also compatible with A3D, EAX and Sensaura 3D. As you would expect from a card which is aimed at the gaming market, it coped with Quake III easily, with no loss of frame rate and clear sound.

Only the lack of creative and leisure software takes the shine off an otherwise polished act.

RECOMMENDED

Guillemot Maxi Sound Fortissimo



PRICE £40 **EX VAT** £34 **SUPPLIER** Guillemot UK
PHONE 0208 686 5600 **ONLINE** www.guillemot.com

During our tests, we found the budget end of the sound card market to be tightly fought. This is not really surprising because many people think of their sound card as a device that only plays simple sounds like CD and MP3 tracks. High-quality audio clarity isn't essential, but if it comes at a cheap price, who is going to turn it down?

The Guillemot Maxi Sound Fortissimo is the best value card, not only because it is good at producing sounds but it can understand lots of different audio standards such as A3D, EAX and Sensaura's 3D audio system. What is more, there is support for two sets of speakers and a SPDIF socket, which isn't always available on cheaper cards.

Although this card also comes with an ACID DJ CD to create some neat sound effects, a game would have made the package even sweeter.

Stay in touch

You can run but you can't hide. Unified messaging now means you can stay in contact anytime and almost anywhere. Simon Pickstock reveals your options

Being able to get a message across has been the driving force behind a number of technologies, from semaphore to e-mail. We are now more reliant on communications technology than ever before, and over 25 million people in the UK now possess a mobile phone. As if that wasn't enough, a new technology has emerged called unified messaging. What this basically boils down to is a single personal phone number, with which you can be contacted pretty much anywhere on the globe. Personal numbers have been around for a few years, but it has only been recently that the unified messaging idea has taken off. With this system, one phone number enables people to contact you at work, at home or on your mobile – and even leave voice messages and send you faxes. We take a look at four of the services available. PCP

PCPlus EDITOR'S CHOICE

→ Simply the most flexible way of diverting your number, with a choice of three phone numbers to try if there's no answer.

Coms.com

The best Web site we tried, ideal for business users

Coms.com is fast, easy-to-use and well laid out. One of the best options is the ability to choose your own number, within reason. This means that if you don't like the default choice, you can keep clicking the change button until you find something you like or is more memorable.

Coms.com also offers the most flexibility in how you divert your number, using a system of groups to set up conditional diverts. For instance, in group one you can set up the number to divert to your office number between, say, the hours of nine to five on weekdays, and you home number at weekends and evenings. You can set up a further two numbers in each group, so if there is no answer on your office number it will try your second and then your third number. In addition, you can choose to always forward to a single number, or even turn forwarding off, so that all calls go straight to voicemail for those times when you don't want to be disturbed. If there's one gripe, however, it's that the time intervals are set in one hour increments.

As with the other services, you can configure your account from either the Web site or by calling your own number, although the Web site is by far the easiest route to take. A handy touch is the use of a call log. This shows who has called you, when and, where possible, the originating phone number.

Numbers are in the 07080 range and are charged at 30/20/10p per minute to the calling party.

PCPlus Verdict 9/10

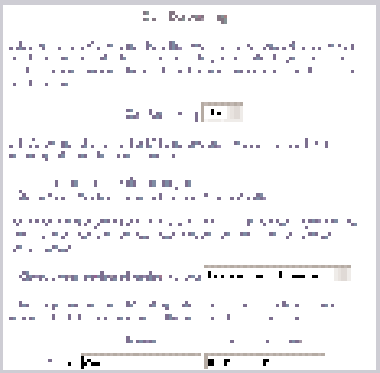
← You have to sign up to Contact Box's ISP service and your personal number will only follow you to one number at a time.

www.contactbox.co.uk

Contact Box

Contact Box is different from all the other providers here in that it is an ISP. Although the service is free, you do have to sign up for a Contact Box e-mail address and you then need to run an .ins file to set up your Internet settings. If you already have an Internet account you don't want to lose, we recommend you download the .ins file instead and rename it as a text file. Then take the settings from there, otherwise it will overwrite your other settings and set itself up as the default ISP. As well as the usual follow me style number, you get 25MB of Web space plus e-mail, a Web-based organiser, online games and an online TV guide. You can choose either an 0702 follow me number or an 0870 one which only diverts to a national rate number. Call charges are 37.5/25/12.5p per minute to callers.

PCPlus Verdict 7/10



← Aimed more at the home user, but YAC still has some excellent features such as call screening for those people you want to ignore.

www.yac.com

YAC

(PC Plus should declare an interest here: we have been running promotions with YAC for several months in the mag.) Right, onto the review: YAC's service is free as revenue is generated from callers ringing you on your personal number. YAC offers call forwarding, call screening and group messaging, plus the usual voice messaging and fax facilities. In terms of access, you can call up your number and change the settings from there or, if you prefer, use an 0870 number which is charged at a lower rate. YAC is aimed more at the consumer than business but when you sign up you can choose your own YAC business cards with your new number on them. Phone numbers are in the 0709 range and charged at 32/22/10.5p per minute.

PCPlus Verdict 8/10

← A note at the top warns you that not all providers offer all services, but there is no indication of which ones do or don't. Confusing at best, appallingly amateur at worst.

http://dmclub.net

DMClub

The least impressive of the lot, certainly in terms of the Web site with the log in page generating errors initially. You can choose two 07050 numbers, one for voice, the other for fax, and the personal number can be set to 'hunt' several numbers, for example office, home and mobile, until it finds you. Faxes and voicemail are forwarded to the e-mail address of your choice, and voicemail arrives in RealAudio format which helps keep the size down. However, the sign up process is confusing, it is complete guesswork as to which provider you should choose. Unfortunately, while the service looks good, the Web Site looked amateurish and it took a long time for our number to be activated. Charges are 37.5/25/12.5p per minute to callers.

PCPlus Verdict 5/10

COVER STORY

←The Media Player is the key addition and marks another stage of the evolution of the PC into an entertainment device.

OPERATING SYSTEM

Windows Millennium

SUPPLIER Microsoft **RELEASE DATE** 14 September
UPGRADE PRICE £80 **ONLINE** www.microsoft.com

Dermot Hogan looks at the final release version of Windows Millennium and discovers there's much to shout about in Microsoft's quietest launch

This is it. The end. The last one. The final version of Windows 3.1/95/98/98SE ever. Well, probably – we've all heard this line before from Microsoft. This time it's Windows Millennium, the latest (and according to Microsoft) the last in a long line of Windows releases.

↓Finding a Webcast radio station is easy with the Media Player. In spite of the low bandwidth, the quality is quite acceptable.

Microsoft has stretched the Windows elastic one more time to produce another 'consumer' version of its highly successful Windows 9x series operating system. The emphasis is on three main areas: multimedia, home networking and the Internet and last, but not least, Windows 'self-repair' systems.

Unlike Microsoft's other new operating system, Windows 2000, Windows Millennium hasn't been totally rewritten to address fundamental deficiencies. Millennium is more of a house refurbishing job rather than foundation work. Still, it's quite a substantial upgrade with more in it than you might expect.

Entertainment, entertainment and entertainment

Windows Millennium is described by Microsoft as a 'consumer' Windows to distinguish it from the altogether more serious 'business' Windows 2000. This means that Millennium is aimed at the less nerdish and more enjoyable aspects of PC life: games, photography, film and music.

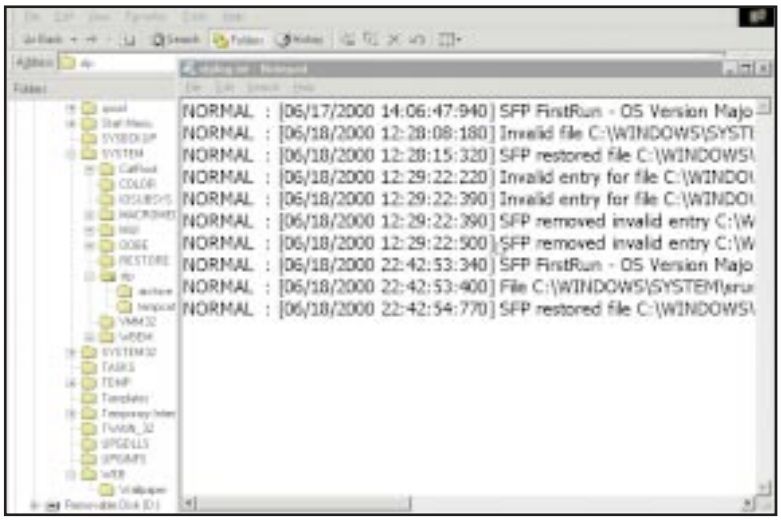
Millennium comes with a small selection of Internet enabled games, Backgammon and Draughts (Checkers in the USA) among them. We tried out the Checkers program and suddenly we were pitted against a Danish opponent –at least that's what the status bar said. Millennium had connected to the Internet, located the Microsoft gaming server and found an opponent. With one click, too: it was a bit startling. Having won that game (we cheated: we claimed to be a beginner), we went on to play several more. Then we got our comeuppance as we were whitewashed at Backgammon.

While we were playing Internet games, we were listening to the BBC World Service News on the Windows Media Player and checking the state of the Dow Jones index on the Bloomberg Financial TV Channel. And then the penny dropped. Anyone could do this. You didn't have to download a RealPlayer, find a gaming Web site, locate a broadcast server – and get it all to work. Three or four clicks and that was it. Though, to be fair, getting a RealPlayer isn't that difficult and it is still needed for non-Web cast radio and most sound clips.

Microsoft has again done what it has been so good at in the past. It has taken existing technology, put it together as an operating system release (the Media Player absolutely is an integral part of the operating system, your Honour) and – critically – made it easy to use. This is the future of the Internet. It's not just the World Wide Web or e-mail: it's entertainment and news. Further, it's moving out of the hands of the technically sophisticated into the hands on the man or woman on the proverbial omnibus – literally with WAP phones. This is what Windows Millennium is about – making entertainment on a PC easy to use. It's by no means perfect, but it's clearly the way things are going.

The Media Player isn't anything radically new. It's just that it brings together a number of existing technologies in a way that makes the whole greater than the sum of the parts. The Media Player will play MP3 files, 'rip' an audio CD (that is, copy tracks from an audio CD on to your hard disk) and let you build a collection of tracks which you can then copy on to a portable player such as a Rio. It handles streaming Internet content (radio and video) adjusting its compression and bandwidth settings according to the traffic conditions. In passing, it's also interesting to note that Microsoft thinks the Media Player so important that it has by default got a space on the Quick Launch Toolbar along with Internet Explorer and Outlook Express.

There are some problems and restrictions with the Media Player. The version we had was slightly buggy, not displaying Web cast TV under some



↑Millennium comes with Windows 2000's System File Protection. A log is kept of files that application tries to sneak into the system.

circumstances. Also, the Media Player doesn't seem to handle DVD films – you have to use either the Windows DVD player or, in our case since Millennium didn't detect our DVD player, use custom DVD software.

Making movies

Additionally on the home entertainment front is the Movie Maker, a home video editing suite. This enables you to load clips from a digital movie camera and stitch them together with a reasonable editing suite. You won't be able to produce Star Wars with it, but for editing down your holiday/wedding/school videos into something less excruciatingly boring, it's not at all bad.

Similarly, Millennium now supports digital cameras. In practice, this doesn't mean that much as all digital cameras come with software that enables you to upload the pictures into your PC anyway.

Still, as with printers a few years back, the existence of a standard should enable a more uniform approach to camera software and allow some reasonable and simple to use picture processing software to emerge. In our view, the rather feeble Microsoft Imaging software provided by Kodak and currently incorporated in Millennium (as in Windows 98) is in no way adequate.

Restoration comedy?

Once, a computer required a building to itself, attended by white coated servants. In those far off misty days of pre-history, networking was a black art, close to necromancy as a desirable skill to have on your CV. But these days, every man and his dog has a computer – and even the dog's got a 600MHz laptop. However, networking the things – connecting two computers together with a less than high-tech piece of cable – is still far too difficult. It should be easy: plug in your network cable and off you go. But often you fall into a maze of twisty networked passages with more incomprehensible error messages. The inevitable follows: reformat your disk, re-install Windows and swear off networking for life.

Millennium is a good stab at making networking less of a mystery. In many respects it's a huge improvement over its predecessor. The Networking Wizard is so good that as we installed Millennium, we thought that it hadn't detected the network

→Upgrading from Windows 95/98

How much will it cost and what are the requirements?

The latest news is that upgrading to Millennium will cost the same as upgrading to Windows 98 did, that is, about £80.

It's certainly possible to upgrade from Windows 98 machines, and in theory, from Windows 95 machines. However, when we tried to upgrade a venerable (but quite reliable) PC running Windows 95 with a respectable 48MB of memory but only a 100MHz CPU, Millennium refused. It was a point blank refusal, too, 150MHz was the minimum required and that was that as far as Millennium was concerned.

Since a good number of Windows 95 machines will be running on processors that by today's standards look pretty feeble, you may well discover that upgrading from Windows 95 could be a moot point.

Other upgrade issues will come from programs that require just DOS to be running and not Windows. Some older (well, ancient, by now, but they're still around) programs check for Windows and will refuse to run if it's in memory. A new setting in the program's Properties (the old PIF file) lets you stop Windows being detected by such programs.

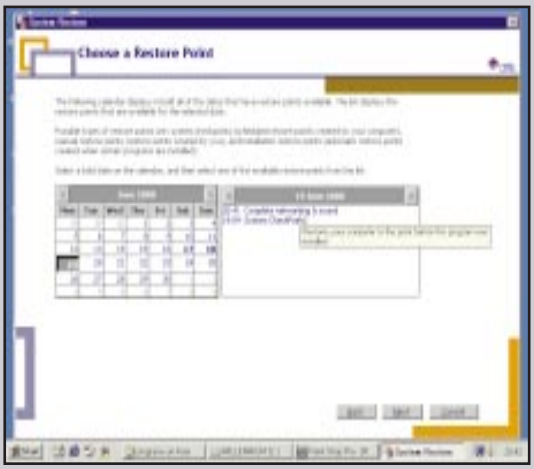
Other problems will occur for programs that require just DOS and DOS alone – you'll have to boot from the Windows Emergency diskette for these.

Maintaining your system

Does Millennium promise greater reliability with its System Restore facility? We found out below:

1 The System Restore utility is one of the most useful new features in Millennium. With just a few clicks of a mouse you can get out of many tight corners.

2 Millennium itself will create 'restore points' on a scheduled basis. But you can also create your own restore point at any time.



3 You select a restore point using a calendar-like utility – a good idea since you can easily choose a restore point before you think your system started to misbehave.

↑As in Windows 2000, Personalised Menus help prevent the 'menu maze' that is so characteristic of Windows 98.

Your alternatives

How to have most features without paying...

Millennium, apart from being a general improvement over Windows 98, essentially integrates the Internet and Multimedia. This is done via the Media Player which enables you to rip your own CDs, play MP3 files (and other formats if you've got the right codec), download files to players and listen to Web cast radio stations. All this software is available in one form or another either commercially or as shareware, so you can, if you wish, do your own thing here. However, we still needed to download a RealPlayer to listen to music clips on, say, Amazon, and to listen to non-Web cast radio stations such as BBC Radio 4.

Hardened Internet gamers will already be using the available servers and programs to hack their way through multi-user dungeons, save damsels in distress, and so on, so Millennium will have little to offer here. However, for someone who's never dabbled in this area, the ability to simply click and enjoy a relaxing game of draughts with one click is quite novel. With apologies to those who consider draughts to be a life-or-death business, Millennium makes this sort of harmless activity easy and enjoyable to use. That's the point really. While you can get most or all of this stuff elsewhere on the Internet, with Millennium it's all there and set up. And it does work, too.

card properly since we weren't asked any of the expected questions, such as 'do you want DHCP address allocation?' and other such mumbo-jumbo, designed to keep the fine arts of networking away from the uninitiated. Instead, Millennium just examined our network, found a DHCP host (that's a server that allocates a network address) and connected. Connecting to the Internet was equally simple and virtually invisible. Millennium just copied our Internet settings from another computer. So far, very impressive.

But – and it's a big but – it's still Windows 95/98 underneath. While Millennium is smarter than its forbears on sniffing out what's going on and making home networking and Internet connections easy, it's still possible to reduce a networked PC to an incoherent mess. For example, we misunderstood a Networking Wizard question about sharing an Internet connection and selected the wrong option.

A seriously bad move, as it turned out. Nothing worked anymore – no Internet, no local network and lots of incomprehensible error messages. A little knowledge may be a dangerous thing but we can verify that in Millennium, it's still possible to screw things up – as we well and truly did.

Just as we were gloomily resigned to either re-installing Millennium or (nearly as long-winded) working out exactly what combination of registry settings, network card parameters and IP addresses was needed, we discovered the Millennium System Restore facility. This isn't just good; it works. Better, it's easy to use – even for idiots who press the wrong button.

Essentially, either you or Millennium itself can create a 'restore point' at any time. Millennium automatically creates a restore point whenever it detects a major change is going to happen to the system. Equally, you can create one yourself if you think that you may be about to do something iffy. Restore points work by storing critical system information such as the Registry and the associated system files that the Registry refers to together on your hard disk. Millennium can then use this information to get back to a working system. Not just a basic working system, either, but the one you want.

Finding and using a restore point is easy. The restore points are organised on a calendar basis using a standard calendar control. All you have to do is remember roughly when you created a restore point (or equally, look for the last one before Windows went south) and restore it. After a quick reboot (and they are quick in Millennium), you should be back in action again. You can repeat this process any number of times, moving back and forward over the restore points as you wish. The only question we've got is why on earth did it take Microsoft so long?

Technical improvements

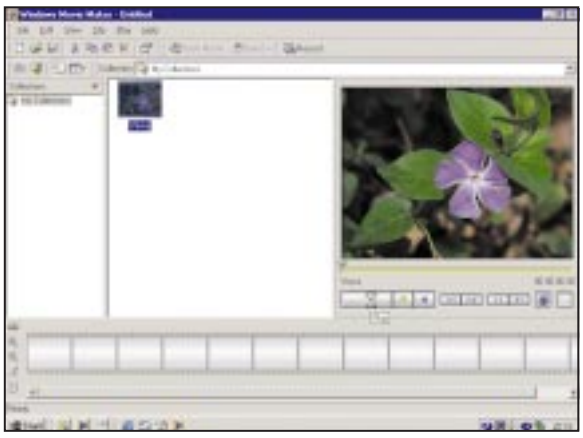
Over the years, features that have first appeared in either Windows NT or Windows 9x releases, have then appeared in the next release of the other. Mainly, though it's been a transfer of functionality from Windows 9x to NT – the new style shell and plug-and-play, for example. With Millennium, though, several features have been transplanted back from Windows 2000.

First, there's the System File Protection (SFP). This stops applications installing their own copies of critical system files over the 'authorised' ones from Windows itself. Take for example, MFC42.DLL. This file is used by just about every application of any size – and every application of any size also has its own idea of what the latest 'bug fixed' version should be. The result – multiplied by the number of applications and the number of system files each wants to copy into Windows – has been mayhem. Historically, this has been one of the key reasons why Windows systems seem to degrade over time; eventually, everyone seems to end up reformatting and re-installing Windows. With SFP, Millennium tracks what files should be there and quietly re-installs its own version if an application tries to sneak in an incorrect version.

Next, there's Personalised Menus. This feature improves on one of the less desirable features of Windows 9x where huge menus cascade across the screen making it difficult to see which item you really want. Instead, only the most recently used menu items appear. If you wait a bit, all the menu items will then appear. We've found it in practice to be a surprisingly large improvement to the system usability.

Last, compressed folders may have made an appearance. These function in a similar fashion to zip files – but they look like normal folders. In theory, at any rate. We couldn't create a compressed folder – there didn't seem to be a way to do it, even though it was clearly described in the help system. This may be a feature to come later – but it's far too late for this sort of feature to be missing. PCP

↓For budding Spielbergs, Movie Maker lets you edit your home and holiday videos into historical epics.



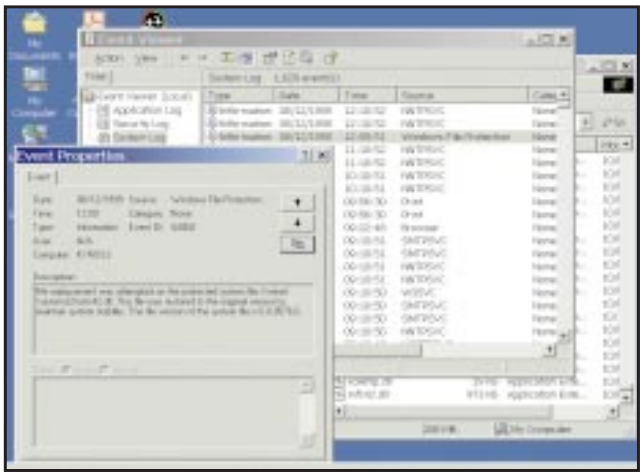
Windows 2000 vs Windows Millennium

Windows is splitting ever more obviously into consumer and office versions but where does that leave the user who wants a bit of both?

While Windows 2000 was being rolled out, Windows Millennium was quietly cooking away on a back-burner in the Redmond kitchen. So as not to spoil Windows 2000's big day, not much was heard of Millennium. So much so, that you might think that Microsoft didn't really care about Millennium. Certainly, the rumours were to the effect that Millennium would be cancelled and replaced by a 'consumer' version of Windows 2000.

A consumer version of Windows 2000, codenamed 'Neptune', is certainly in the works – but it seems that a low end version of Windows 2000 is still some way off. One of the big problems with Windows 2000 is that the majority of games will simply not run on it. Microsoft took the fundamental decision to abandon compatibility in favour of operating system stability for Windows 2000. If DoomRaider III didn't run on Windows 2000, so be it: the integrity of the Windows 2000 kernel would not be compromised. And in practice, Windows 2000 has been absolutely rock-solid in our experience. In contrast, in Millennium, games that run on Windows 98 should run on Millennium – it's more backward compatible in that respect. But as a consequence, Millennium will not be as stable as Windows 2000. You can still expect downtime with Millennium.

But in another area, Windows 2000 is now streets ahead of Millennium. Millennium is still basically Windows 95 underneath; you still have to reboot the machine every time you tweak the networking – or install anything major. With Windows 2000, with very few exceptions, you don't have to reboot.



↑Windows2000 has influenced Windows ME but they're still very different affairs.

Should you upgrade to Windows Millennium?

Plenty of new features but are they enough to make you put hand into pocket? We take a look at the headline stuff that should interest you

It's here at last and in spite of all the rumours about Windows Millennium – no networking, just a marketing exercise, and so on – Microsoft does seem to have done a reasonable, indeed a good job, on improving Windows 98.

It's curious that Microsoft has been so quiet about this because it has been a surprisingly quiet launch for what is a significant upgrade to the company's most important product.

New features

Enhanced Internet and network set up, repair facilities and system security all add substantially to the ease of use and reliability of Windows.

But it's still the same Windows 9x core – and this will never be as stable as Windows 2000, Linux or even the old, much abused OS/2.

However, the upside of this is that Windows Millennium will run the vast majority of available games, home entertainment and other programs without trouble, while the other operating systems mentioned won't.

It's a trade-off, and one that Microsoft has managed to engineer, again, in a successful manner.

Media Player

To us, the big innovation in Millennium is the Media Player. This isn't just because it makes using the Internet entertainment and news facilities easy (as opposed to just browsing the Web), but because it points the way to how Microsoft seems to be addressing the convergence of content and technology on the Internet. This is interesting in itself.

The Media Player pulls together CD audio, downloaded video and MP3, Web cast television and radio – all in one place. Sometimes it's a bit clunky, sometimes it's slow and sometimes it's still a bit buggy.

But overall, especially for the technological mortals among us, it's a big improvement on the disparate pieces of software that are needed do the same job. A somewhat surprised thumbs up from us.

New features rated

The key features under the microscope

	Multimedia	Networking	Improvements
For	Excellent multimedia and Internet integration	Easy to use and set up	Several useful additions taken from Windows 2000
Against	Being whitewashed at Backgammon is depressing	Not quite, ahem, foolproof	Not all worked in RC3
VERDICT	10	9	8

↑We found we still had to download RealPlayer to listen to certain non-Webcast radio stations such as BBC Radio 4.

↑You can change the 'skin' – the appearance – of the Media Player to a number of predefined tasteful formats.

PCPlus Verdict

WINDOWS MILLENNIUM

☑FOR
→ A surprisingly substantial improvement to Windows 98

☒AGAINST
→ Still Windows 9x underneath; it isn't Linux

Stability	8
Ease of use	9
Range of features	8
Performance	9
OVERALL	9

↗The Webload 1100 looks solid, feels solid and acts solidly. The relationship between a server administrator and their server is based on trust – you can really trust this box.

PCPlus BEST PERFORMER

WEB SERVER

Xinit Webload 1100

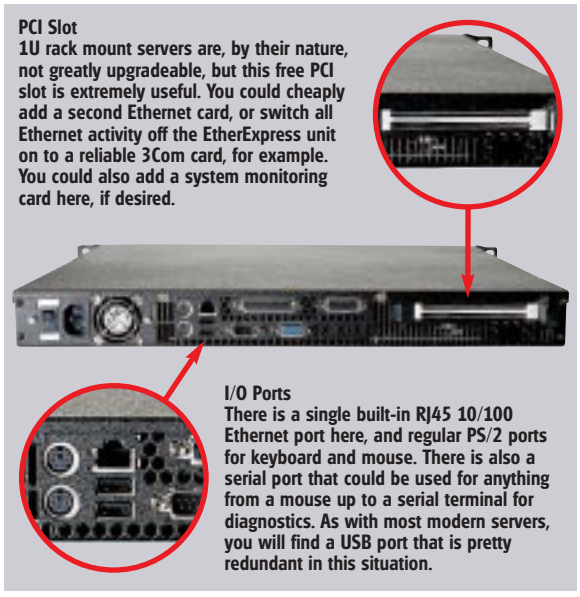
PRICE £1,156 **EX VAT** £984 **SUPPLIER** Xinit
PHONE 0207 247 476 **ONLINE** www.xinit.co.uk

You could fit 42 of these in a standard rack – is this everything you need to build a powerful Web site?

The Cobalt RaQ may look pretty, and it certainly performs well, but it has a few limitations. It's a very closed system. With proprietary this, that, and t'other, there are few people you can turn to when things go wrong. It doesn't include any mounting brackets for storage in a rack. If you ever take a look in London's Telecity, you'll quite often see 30 or 40 RaQs balancing precariously in a case, just waiting for some troublesome young system administrator to come along and shove the whole lot over.

If the RaQ is the closed, point and click solution, then this 1U rackmount box is the server for power users who know Linux, and need the power and flexibility of a fully open solution. This isn't a server that you could take out of the box, power on, and there you have a secure Web server by magic! Well, that's not strictly true – you could, and there's a chance that it would work (assuming that the pre-installed IP address and subnet are valid on your network).

There's a 600MHz Pentium III under the bonnet, with a 20GB IDE hard drive, CD-ROM, and floppy all included. There's 128MB ECC SDRAM on one DIMM, upgradeable to 512MB. If you don't need a CD-ROM drive, this can be replaced by an optional LCD status display, as in the Cobalt RaQ. The server uses the integrated Intel 82810 chipset, so the Ethernet adaptor is on board. The EtherExpress 100 tends to be a bit sickly with the open source drivers under Linux, and our server refused to come back up after a soft reboot. There's a loadable module update on Intel's site which clears the box of its Ethernet ills. Thankfully, Xinit usually install this module before shipping the server, so you shouldn't see the problems that we had.



PCI Slot
1U rack mount servers are, by their nature, not greatly upgradeable, but this free PCI slot is extremely useful. You could cheaply add a second Ethernet card, or switch all Ethernet activity off the EtherExpress unit on to a reliable 3Com card, for example. You could also add a system monitoring card here, if desired.

I/O Ports
There is a single built-in RJ45 10/100 Ethernet port here, and regular PS/2 ports for keyboard and mouse. There is also a serial port that could be used for anything from a mouse up to a serial terminal for diagnostics. As with most modern servers, you will find a USB port that is pretty redundant in this situation.

↑ **Xinit haven't skimped on components, largely thanks to the integrated Intel chipset. Everything from a free PCI slot to a USB port are included in the box, and all are useable under RedHat 6.2.**

Inside information

Lifting off the lid reveals a remarkably tidy set up. Cables were neatly stored away from components, and there was little clutter – remarkable for a 1U rack mount. Careful thought has been given to cooling, with three fans bringing air in over the hard drive and across the RAM and CPU, before being expelled by a single fan at the back. After three days of persistent uptime, the expelled air was still cool. There's a single PCI slot available via a riser card, so you could add another PCI ethernet card if you wished to. Around the back, you'll find the usual array of USB, serial, VGA, and parallel ports – but there is no SCSI in this system (it is available as an option).

RedHat 6.2 comes pre-installed, with all of the latest updates, and the latest kernel pre-compiled, tailor made for the specifications of the unit. It is this pre-sale attention to detail which sets Xinit apart from most other OEMs. That, and the free 24-hour telephone technical support, three year on-site warranty and free delivery!

Administration is primarily handled by the LinuxConf tool, which can be run across a telnet, or over the Web on port 98. The Web interface isn't visually appealing but it does the job, and does it well. LinuxConf handles regular system configuration, and also includes modules for Apache, Samba, Sendmail and the like. As a purely personal preference, we installed Webmin. The RPM went on in two seconds, and the webmin server was up and running instantly.

www.webmin.com

Taking the load

We load tested this server with 20 virtual users on two 500MHz Windows 2000 PCs. Each virtual user connected to the Web site, making a series of demanding MySQL database calls (calling large records from 20 tables across 3 databases). They downloaded a 640MB ISO image over HTTP in the background, before clicking around a graphically intensive Web site.

The server responded well. All page requests were handled in well under a second, there was no thinking time on any request, and no wasted time. At its most strained point, the server dropped to 94 per cent idle which is very respectable indeed. Out of 390 transactions on the server, only three failed.

A polished product

You get the RedHat distribution manuals in the box, and any questions that it can't answer, Xinit will. This is a remarkably polished product, that benefits from robust build quality, excellent pre and post-sales care. This, together with the Xinit's personal touch make this a definite best performer.

Rob Fenwick

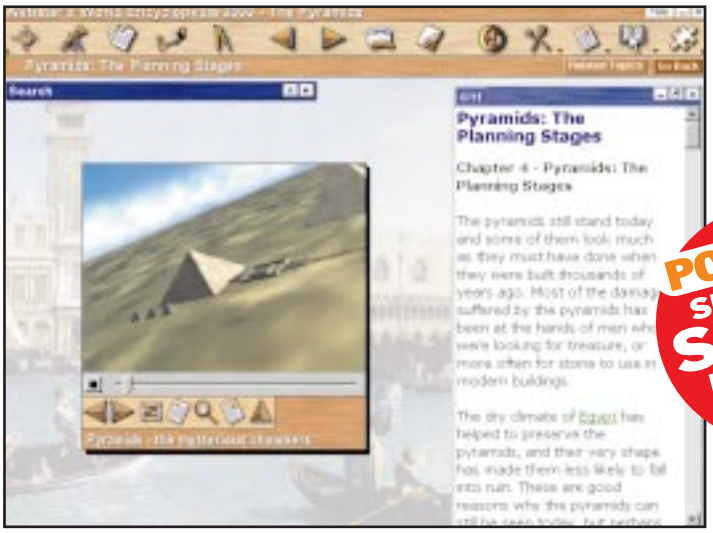
PCPlus Verdict

XINIT WEBLOAD 1100

✓FOR
- → Reliable, solid pre-configured server
- → Fast

✗AGAINST
- → Slightly suspect Intel EtherExpress on-board NIC

Specification	9
Quality	10
Performance	10
Value for money	9
OVERALL	**9**



←Webster's World Encyclopedia 2000 guides you through the mysteries of the past, such as this tour of the pyramids.

PCPlus SEE YOUR SUPER DISC

Encyclopedia

Webster's World Encyclopedia 2000

Parched for knowledge, but can't find anything to quench your thirst? Let Webster's World Encyclopedia refresh you with information and facts

www.websterpublishing.com

Specifications Win95/98, 16MB RAM, 256 colour display, CD-ROM drive

Webster's World Encyclopedia 2000 is a comprehensive multimedia reference product that includes vast amounts of knowledge. It includes over 53,000 articles, more than 12,000 photographs and illustrations, over 45 movies and animations, and additional charts and tables.

The program is based on the Cambridge University Encyclopedia, Cambridge reference works and other documents and news bulletins from history, right up to the end of 1999. It's the most up-to-date encyclopedia we've had the pleasure to put on our **SuperDisc**. In fact, the program is still on sale in the shops. Although it calls itself an encyclopedia, Webster's World Encyclopedia 2000 is much more. So, what can it offer you?

Yet another encyclopedia?

Webster's has a plethora of other features to offer. One of the most original is the Millennium Book of Prophecies, a collection of over 700 predictions complied by one author. Well known predictions, from Nostradamus, Old and New Testament prophets to more current seers such as John Robertson who foresaw the sinking of the Titanic and Jeane Dixon who, in 1963, should have stood on the grassy knoll in Dallas, Texas and shouted "duck!"

Explore the past

If you prefer looking back in history rather than gazing into the future, then the program provides for this, too. There's a large section entitled Exploring the Past, where you can view the history of medicine, warfare, modern world history and an in-depth view into the history of a selection of countries. There's even a huge collection of historical US documents that you can view, including the Declaration of Independence.

Our World and Beyond is a collection of more modern events and facts to do with the world we live in today. Here you'll find complete day-to-day news stories from 1996 until the beginning of 2000, information about the United Nations and lots more. There's even a fully featured atlas, and a book about the major historical events of the 20th century.

↑The Millennium Book of Prophecies guides you through a wide range of premonitions from the past. Have they come true? Judge for yourself...

Look and learn

Back at the main contents page, you'll find a link to two dictionaries: An English dictionary and a Natural History dictionary for things from cells to mammals. You'll also find a science review listing major scientific stories and breakthroughs since 1997 in monthly pages. There's a foreign phrase guide, so you can learn to say all those useful phrases in any language you choose. The Stargazer option enables you to gaze at the heavens from any location in the world, and learn about the constellations at the same time. On This Day shows you what happened on this day in the past and the Tour and Projects option takes you on a selection of tours through the program. You can view animals, the history of flight and lots more. And if there's nothing that interests you there, you can create your own tour for people to take.

Finally, to make sure that you are always up-to-date, Webster's is fully upgradeable from the Internet.

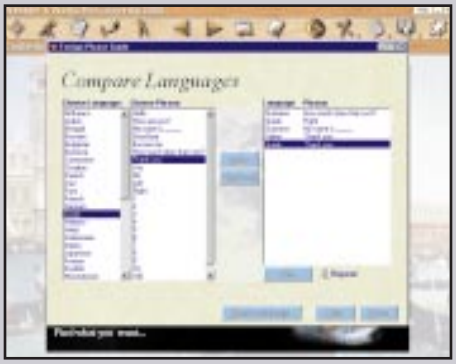
Paul Ravening

Getting started with Webster's World Encyclopedia 2000

What else can you find within its pages? Well, medical dictionaries, phrase guides and much more. Follow our quick guide to get the best from Webster's World Encyclopedia 2000

1 This is the main page of the program. From here you can navigate your way around the entire content of the disk. First we're going to find out how to search for the material you need. Click on the encyclopedia option on the bottom of the screen and it will display the first page for you.

2 Now we want to search for knowledge! Click on the magnifying glass icon on the main toolbar. This will bring up the search window. Decide what kind of material you wish to search for by clicking on the icons at the top of the search window. If you hover the mouse over them long enough, a tool tip will tell you what they mean.

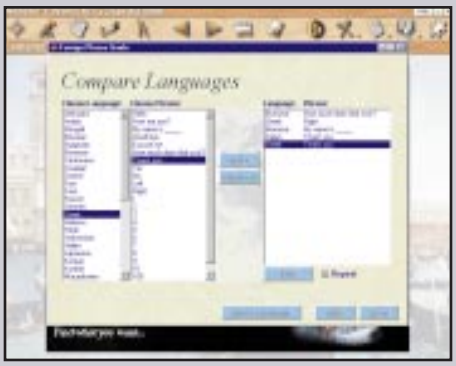


3 Once you've decided, type your text into the box at the bottom of the window. Various selections will be displayed in the results window. When you see one that suits you, click it and the article will be displayed.

4 The Foreign Phrase Guide lets you listen to 20 phrases in 42 different languages. You can even construct a list of phrases and then compare them from different languages.

You can either choose a single language and listen to all of the available phrases, or compare a list of different phrases and languages. To listen to just the one language, select the language you want from the Choose Language list box on the Select Language screen of the Foreign Phrase Guide window. Then just click on the phrase or word you want to listen to.

5 To compare different languages, click on the Compare Languages button. On the Compare Languages screen, select the language you want to hear from the Choose Language list box and then select the phrase you want to hear from the Choose Phrase list box, then click on the Add button. The language and phrase you choose are added to the Language Phrase list box. You can do this several times until you have all the phrases you want to hear. When you have finished selecting, click on the Play button to listen to your selections.



6 Click on the Remove button to remove phrases from the Language Phrase list box. If you want the phrases to loop and play continuously, place a check mark in the Repeat check box. Click on the Stop button to stop the phrases from playing. Click on the Close button when you have finished using the Foreign Phrase Guide.

7 So how do you read a book in Webster's? Once you've chosen a book, you'll be presented with the first page and an introduction describing the contents of the book. From here, you can either click on Continue to read the book or Contents to get back to the main menu.

8 Having clicked Continue, you'll be presented with the Contents list of the book you wish to read. Reading books in Webster's is different to browsing the Encyclopedia because most of the actions you need to use are on the book pages themselves. For instance, if you use the back and forth icons on the toolbar, you'll find yourself hopelessly lost in reams of information. Be sure to use the 'next page' option within the book pages.

9 Once you've clicked on a Chapter to start reading, the text will be displayed on the right, and any relevant pictures will be shown on the left.

E-commerce Web site creator

WebShop Designer 2000

Make your millions on the Net – let Webshop Designer 2000 help you

PCPlus SEE YOUR SUPER DISC

Webshop Designer 2000 is your gateway to designing Web pages, managing Web sites, creating graphic objects and much more. This application opens the door to the Internet, providing you with all the tools you need to create dynamic and exciting Web sites.

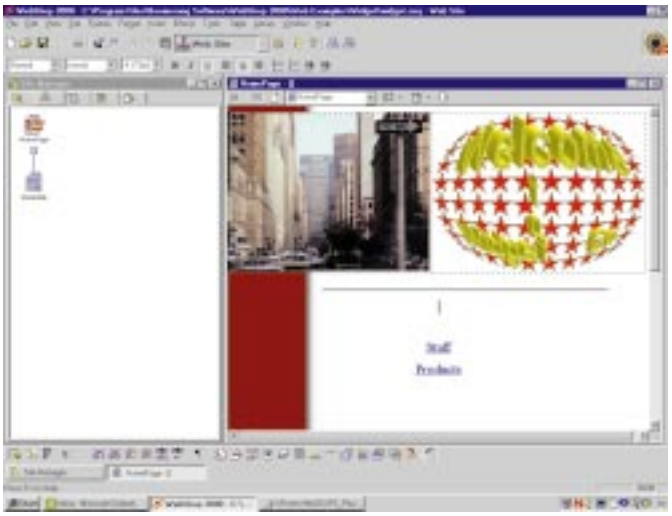
Webshop Designer 2000 includes the new release of the award winning Internet Design Shop Gold. It has significant enhancements and a number of pioneering new features. The program is actually many applications in on, providing you with a rich assortment of tools and utilities for graphic work. All of these tools are easily accessible directly from the WebShop application window.

Fully-featured package

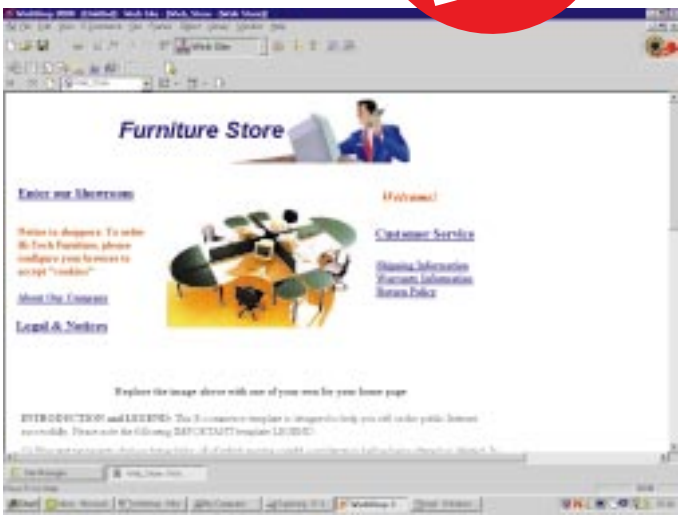
As it says on the box, this really is the "Complete E-Commerce Solution for Everyone," making it easy to put your small business on the Internet with a fully-featured e-commerce Web site, complete with shopping cart, hit counter, forms, frames and animated graphics. It offers just about every trick of the dot-com trade, including automatic e-mail responses, online marketing surveys, order processing, setting up a customer database and secure online credit card transactions.

Webshop Designer 2000 lets you set up a site using an interface that resembles a word processing program so you can drag and drop various components to where each will be displayed on a customers' browsers (it supports both Netscape and Microsoft Internet Explorer browsers).

As a Web authoring tool, WebShop Designer 2000 features free-form positioning of objects (forms, images and so on), and supports Cascading Style Sheets, ActiveX, and database connectivity via ODBC and SQL. There's also a Site Manager component for managing more than one Web page at a time.



↑The site manager enables you to control your entire site from one window.



↑A simple site like this will only take minutes to create.

The construction of your Web site is simple. The page editor supports WYSIWYG (What You See Is What You Get). Everything you type and see in this window is displayed in the same manner in the browser (except some active elements and imported HTML). However, you can edit the code manually if you want. The page editor also supports frames and lets you edit the frames of your page without opening them first.

The window setup

On the left-hand side of the window, you'll see a site manager which gives you a completely unrestricted view of your site, so you can see where a page links to, and what its contents are. The right pane contains the current page you are working on.

Frames and other page furniture can be easily added by clicking on the buttons on the main tool bar – the tool tips will let you know which button is which. If you want a site that is easy to read and understand, you can use the Grids option to enable you to snap objects to grids, keeping your page looking professional and organised.

The Ecommerce menu is where the sales magic is set up. Here you can enter details about you and your company. You can record your address and other contact details that you may wish your customers to have.

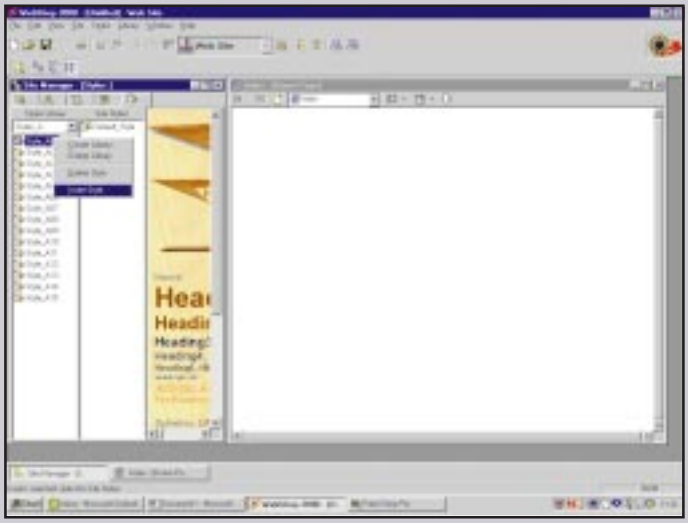
Select Payment Methods lists the forms of payments that you can accept – the most common being Visa, Mastercard and American Express; Shipping methods lets you decide how you'll get your products to your customer; and Products is used to display your merchandise. To help customers easily see products, the program uses product categories to help them navigate through your database and make their shopping trip is an enjoyable one!

Webshop Designer 2000 is an involving but fun program and, who knows, it could even make you rich!

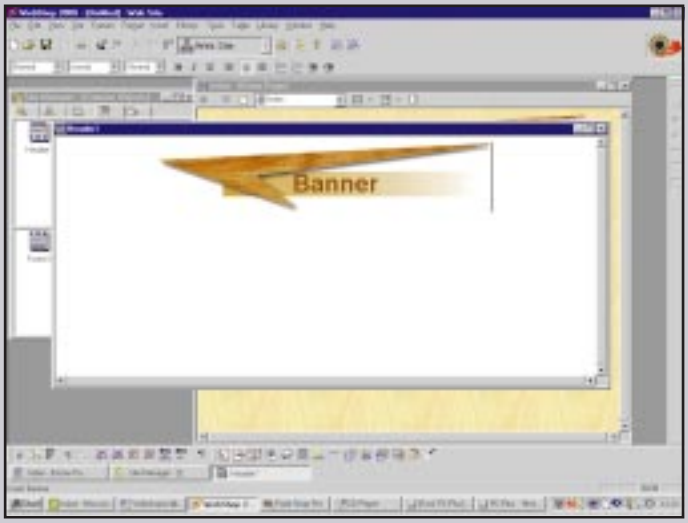
Paul Ravening

Getting started with WebShop Designer 2000

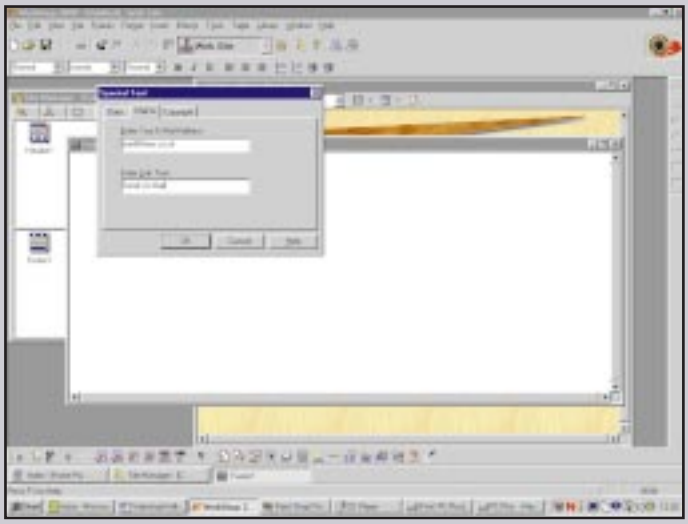
So you want to sell on the Net? Well first you'll need an impressive looking site. Let us show you the basics of site design



1 Due to space limitations, we'll create a basic Web site. When you select File and New, you'll see a list of possible uses for your site, from Ecommerce to Personal. Choose Business and Finance to start with, and click OK. The site will then be displayed with the Site Manager on the left, and the Current Page on the right. Click on the fifth tab along on the Site Manager, click on Style A01 and choose Insert Style to insert it.

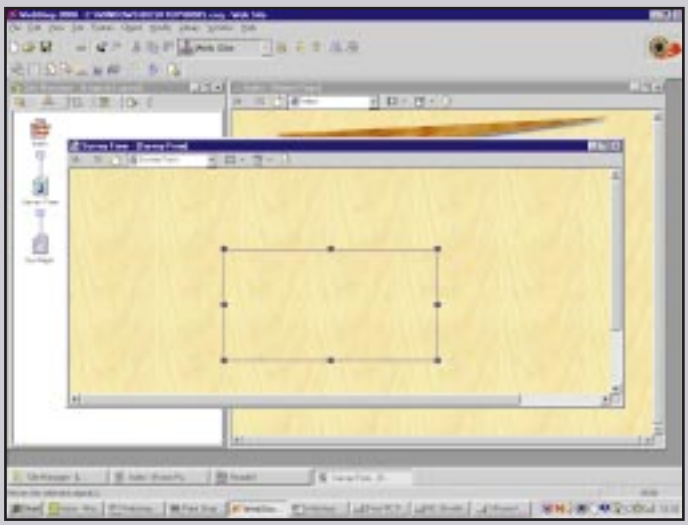


2 We're now going to create a default header for the site. From the Site Manager, choose the Common Objects tab. The Site Manager-Common Objects window appears. Double-Click on the Header1 icon and it will open. Click on insert banner on the Insert Objects toolbar. You can change the text by clicking on the Properties button on the left-hand side of the site screen. Click on Alias, then change the text.

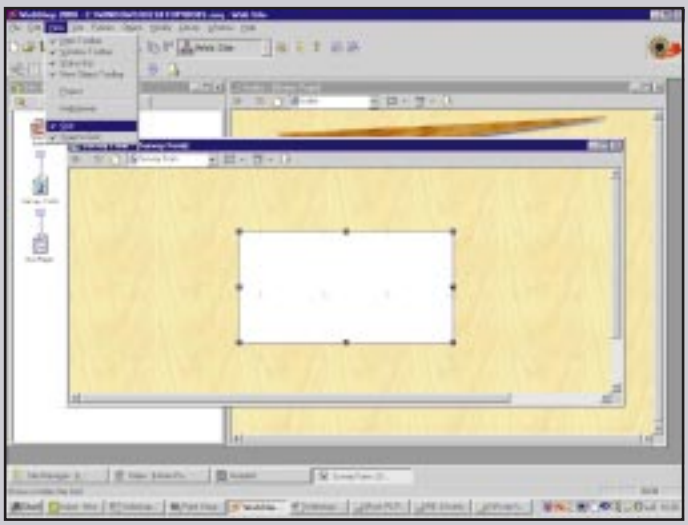


3 With the home page still open, click the Maximise button to give yourself more room to work in. Create a footer by following the same steps as in step 2. Instead of entering a banner, though, click Insert, then Mail To. With this you'll create a HyperLink so people can mail you with a click of a mouse. Type your mail address into the top input line, then enter Send Us Email into the bottom input line.

4 Now we're going to add new pages to our site: We'll create one Free Page, which is slightly different to a normal page (see step 5). Select Logical layout from the main menu and choose New Page. Click Free Page and click OK. Change its name to survey form and press enter to accept the name.



5 Webshop's Free Page feature makes it easier to group images, text boxes and other objects together on the same page. Free pages use 'absolute positioning' to provide a higher level of creativity when dragging and dropping layered objects.



6 From the Site Manager-Logical Layout menu, double-click the survey form icon to open the Survey Form window. Then select View›Grid and Webshop will transform the SurveyForm window background by inserting a grid. Now any objects you insert on the page will align themselves with the grid.

File management program

PowerDesk 4

Windows Explorer just not meeting your needs? Then you need PowerDesk 4, a useful and highly evolved alternative to its Microsoft counterpart

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www.ontrack.com

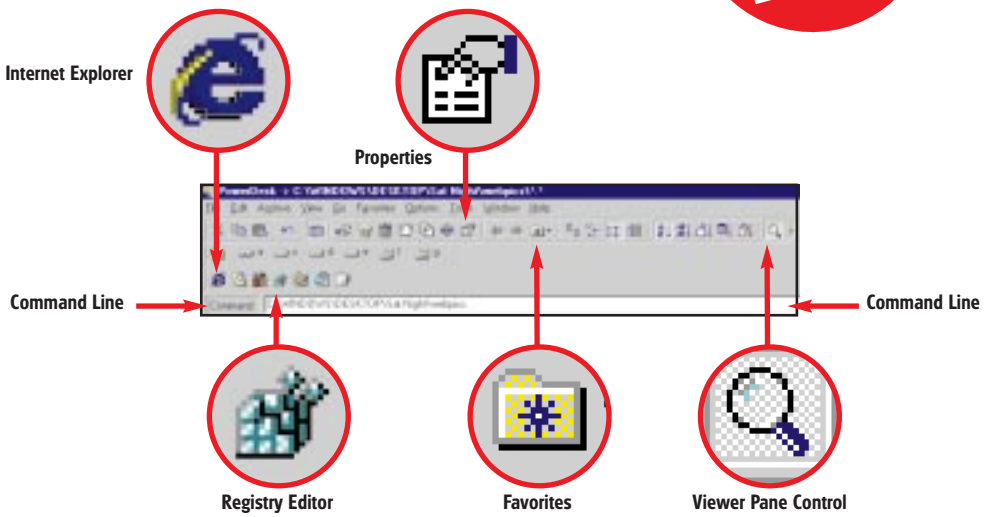
PowerDesk is a powerful file manager which provides you with single or dual- pane file management windows, a powerful file finder, zip and unzip capabilities, a dialogue helper, plus many other features. If you have QuickView or Quickview Plus, you can view many different types of files directly in the integrated PowerDesk viewer pane (QuickView comes with Windows 95, 98 and NT 4.0).

File management

To help you with your file management, PowerDesk supplies lots of tools, gadgets and enhancements to make dealing with your files a much more pleasant experience. When you first run PowerDesk, it provides three icon bars, plus the normal file directory window for you to use. The main tool bar provides a lot of useful shortcuts that Windows Explorer tends to hide away, such as 'Arrange by' and 'move to'. You also have options to mail files to people and either permanently delete files, or just send them to the recycling bin. If you right-click a file, you get the normal Explorer menu and a PowerDesk menu which gives you more options.

Toolbar

The top five commands on the PowerDesk toolbar



Customise your options

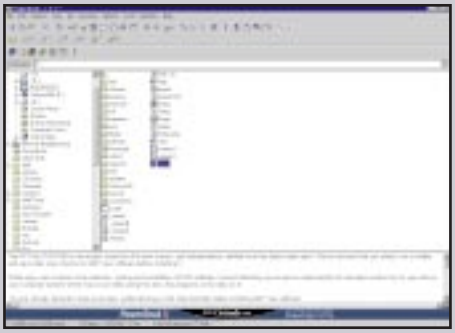
The PowerDesk options are fully customisable, so if you want different icons on them, or if you wish to remove some of them, it's as easy as right-clicking the toolbar and choosing Customize Toolbar. From here you can add, edit and remove toolbar buttons. The toolbar menu also gives you the chance to enable the preview window. If you highlight a text file in PowerDesk, the contents of the file is displayed in the preview window, saving you the hassle of opening it. A wide variety of files can be viewed, from text files to graphics files.

PowerDesk is a useful utility, and one we will be using for some time to come.

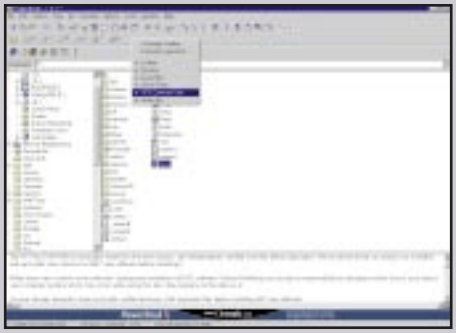
Paul Ravening

Getting started with PowerDesk 4

What PowerDesk has to offer...



1 Here we have PowerDesk with all its available toolbars enabled. If you find this a bit cluttered, you can easily turn them off by right-clicking the relevant bar to view its menu.



2 Here you can edit the toolbars. You can also edit the Launch Bar – that's the third bar down – to launch any program you put on it.

3 Here's where you edit the toolbar buttons. Simply scroll down the left-hand list to view all the possible buttons you can use. When you find the one you want, highlight it and click Add to put it in the right-hand list, which contains all the buttons in use. To remove buttons, simply reverse the process.

£ UPGRADE & SAVE

Ontrack upgrade offers

Upgrade with a 20 per cent discount on a selection of Ontrack's products

If you've enjoyed using PowerDesk 4 on this month's **SuperDisc**, you now have the opportunity to upgrade to any of the other Ontrack software products listed below at a 20 per cent discount off the RRP. This includes ZipMagic 2000 (Winner of the **PC Plus** Value Award January 2000), SystemSuite 2000 (Winner of the **PC Plus** Performance Award May 2000), Fix-it Utilities 2000 (Winner of the **PC Plus** Value Award March 2000), EasyUninstall 2000, Internet Cleanup 2000 and PowerDesk Pro version. All you have to do to take this offer up is go to a special Web site **www.ontrack.co.uk/pcplus** where you can place your order. The offer ends 20th August 2000 and is only available through the Web site .

PowerDesk 4 Pro

This has all the features of PowerDesk 4 plus integrated FTP, a customisable toolbar for fast access to your favourite files and applications, extensive file viewing capabilities for over 200 types of files, a tool that helps you convert graphic files from one format to another and a Size Manager that shows you which files are cluttering up your drive.

ZipMagic 2000

ZipMagic 2000 makes compressed zip files look and act like regular window files so there is no need to open up a separate utility to see what is inside a zip file. It also includes the ability to zip and unzip; span zip files across multiple diskettes; create self extracting files; zip and back up important files and sets of files; and help to download from the Internet if you lose connection, enabling you to continue from where you left off.

Internet Cleanup 2000

This is a quick and easy way of removing Internet tracking data from your system such as cookies, history files, cache files, ActiveX controls and plugins.

Fix-it Utilities 2000

Fix-it Utilities 2000 offers a streamlined, powerful and tightly integrated set of checking, maintenance and tune up utilities including the ability to diagnose and fix disk problems, recover deleted files, defrag and optimise your registry for more speed, fix problems and errors in the Windows registry, troubleshoot your PC hardware, monitor system resources and scan for viruses.

UP TO 20% DISCOUNT

SystemSuite 2000

This is an integrated amalgamation of Fix-it Utilities 2000, EasyUninstall 2000, PowerDesk Utilities '98, the wizard elements of Zipmagic 2000, a virus scanner and a crisis centre to help recover deleted files.

Order online now at www.ontrack.co.uk/pcplus

Full image-editing program

Getting started with Photopaint 2000

Anthony Hannan gets you off to a flying start with Ability Photopaint 2000

Ability Photopaint 2000 is a powerful image-editing and creation programme that enables you to perform a wide range of design tasks, from editing photographs for fun to the creation of more complicated effects. Whatever you want to do, Ability Photopaint 2000 has a range of features that match other more expensive packages of this type. And remember, the version on your **SuperDisc** is a full product – no limitations.

There are four basic elements of the program: selections, layers, filters, and paint and draw tools. Using these, you will be able to create a huge variety of effects and, as you become more familiar with the programme, you can make these as subtle or flamboyant as the mood takes you.

When you begin to work with any image, you will find it useful to select some area that you want to concentrate on. This will ensure the rest of the image remains untouched. In Photopaint, you can select the whole image or drag the mouse over a rectangular or other shaped area. When you have made a selection, you can change the shape of that selection, proceed to select all other parts of the image of a similar colour and zoom in. Zooming in on an area is particularly useful when you want to apply delicate and subtle effects.

You may, for instance, want to change the colour scheme in only one part of an image, leaving the rest of the image untouched. Since all images in Ability Photopaint 2000 are pixel-based, there is no way of automatically selecting, for example, the head of a man from a picture that includes the rest of his body.

→ The same image moments later with the Nova and Liquid Metal effects applied.

www.ability.co.uk

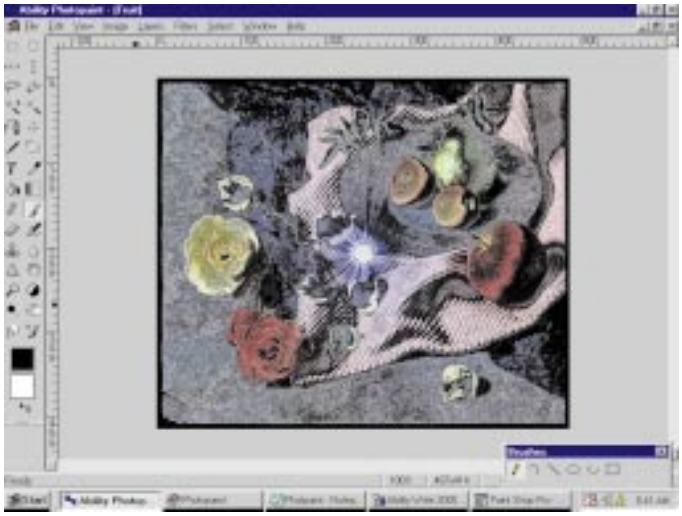
Unlike a mere software package, only you, as the viewer, can interpret one pixel from another and understand what it represents. This is where the selection tools come to your assistance, helping you target the areas you want to work on.

Several selection tools are grouped together at the top of the Tools bar, which is visible on the left-hand side of the screen when you open up a file. Once you've made a selection, you can later edit it to refine its borders, change its position or alter it in numerous other ways. There is a range of editing options available through the Transform Selection tool and the Select menu.

← The opening screen shown with the brushes pallette. Note the range of tools available on the left.

Although a printed image is essentially a 2D arrangement of colours, Photopaint 2000 can utilise Layers. Layers enable you to create a finished image by adding to, and editing, the image on different levels – think of several sheets of glass mounted in a frame and you'll get the general idea.

Each layer can have its transparency changed and different images can be painted on each layer and the overall effect can be subtle. This enables you to make changes to an image on one layer without upsetting the images on the other layers. In addition, the order of the layers can be altered. Altogether, Layers are essential tools in helping you to control how your images are created and edited. Whenever you create a new layer it is shown as a transparent window, usually visible as a checkerboard pattern, by default.



Using the features in Ability Photopaint 2000

Anthony grabs his holiday snaps and takes you through some of the clever features contained within Photopaint 2000

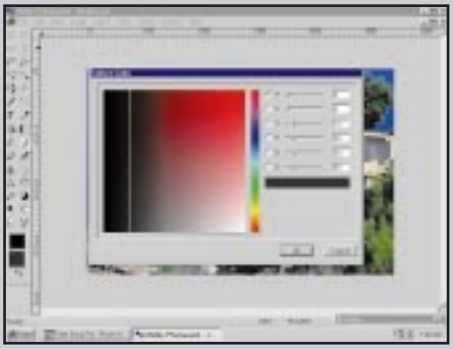
1 The opening screen with an image imported. Note the comprehensive tool box on the left. We're now going to use a filter on the image from the Filter menu on the main menu.

2 Inserting a Lens Flare Filter on to the image – there are variables for brightness and the x and y axis controls.

3 Here we have a Lens Flare. You can adjust its position using the x and y axis controls, if you wish.

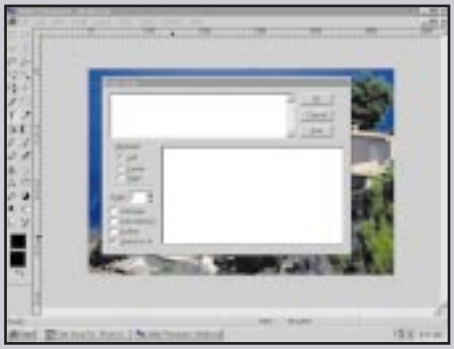
4 The image after the insertion of the filter. There are more than 90 different filter options in Ability Photoshop 2000 that you can use to create dramatic effects.

5 If you wish to make a series of changes, create a duplicate so you can go back to your original in one step if you don't like them –perfect to save time and anguish.



6 Photopaint enables the creation of many different layers. These can also be viewed from the window to the left.

7 Colour balance can be changed through RGB. Note the three base colour equivalents for printing and the options for Shadows, Midtones and Highlights.



8 Text can be inserted on to your image. There are alignment and other selections at the bottom left of the Window. Font, size, shadowing and many other options can be changed from this selection menu.

9 For quick and easy adjustment, Photopaint 2000 enables you to simply adjust the Contrast and Brightness of your current image.

Filters

Filters are the Photopaint equivalents of the filters used in photography to create various effects

As in photography, some filters are merely corrective in that they try to preserve the appearance of the original image while removing some defects, and others radically change the image. Experiment until you're familiar with the affect of each filter or combination of filters on an image.

All of the filters are accessible through the Filters menu. They are grouped into several general categories, for example, Artistic, Sharpen, Distort, Tiles and others. Within these categories there is a wide range of types, many of which you are able to change the properties of to suit your material.

←In no time, impressive effects like the Lens Flare filter are easily mastered with Ability Photoshop 2000.

Hand-held programming software

Symbian Software Development Kits

PCPlus SEE YOUR SUPER DISC

With these SDKs from Symbian, you can create applications for hand-held devices. **Tim Richardson** shows you how

This month, **PC Plus** is exclusively distributing Symbian's Software Development Kits (SDKs) for development in C++, Java, OPL (Organiser Programming Language) and Connectivity (transferring and converting files between a Symbian device and PC).

The SDKs are suitable both for non-developers interested in seeing how easy the Symbian platform is to use, and for those interested in developing for the platform. The SDKs supplied here are all for EPOC Release 5, on which licensees have based devices such as the Psion Series 5mx, Revo, Series 7, netBook and netPad and the Ericsson MC218.

If you are a developer, you should choose SDKs that you want to develop with and install them on your hard disk.

Using the emulator to evaluate EPOC Release 5

Once you have installed the SDK, you can run the emulator simply by selecting one of the appropriate icons from the Start menu – usually in the EPOC Software group.

To run the built-in applications, click on the icons under the screen, or select additional application icons by choosing the Extras button. You can create files using the applications, which will still be available next time you run the emulator.

The Software Development Kits

For all of the SDKs, you need the following PC requirements:

1. A PC running Windows 95, Windows 98 or Windows NT 4.0.

2. The speed and RAM requirements are as for your Microsoft Windows installation.

3. A Web browser (such as Netscape 3.0 or later, or Microsoft Internet Explorer 3.0 or later) that supports long filenames, tables and frames. This is required for reading the extensive SDK documentation.

Each SDK may have additional requirements – see the relevant sections in the installation instructions for each SDK.

To use the EPOC SDK for Java, you need 25MB of free space. If you are installing this SDK with the EPOC C++ SDK for native development, you should install the C++ SDK first. Then install the EPOC SDK for Java on the same drive. On installing the second SDK you will be asked if you want to delete the existing installation on that drive; you must answer no.

To install and run the EPOC Release 5 C++ SDK you will need 300MB of free space and Microsoft Visual C++ Version 5.0 or 6.0 (Version 6.0 requires an additional installation step, which is given as an option when you install the SDK).

You will need 80MB of free space to install and run the EPOC Release 5 OPL SDK. If you wish to develop OPXs (language-extensions to OPL which are written in C++), you will need the EPOC Release 5 C++ SDK.

For the Connectivity SDK you will need 5MB of free space, Microsoft Visual C++ version 5.0 or 6.0 and/or Microsoft Visual Basic version 5.0 or 6.0. It is possible to use other programming languages such as Delphi, but examples are not given in the user documentation. If you have EPOC Connect (or PsiWin) installed on your PC, for ease of use you may wish to copy any type library (.tlb) or .ocx files supplied with the SDK into your EPOC Connect installation directory (usually \Program Files\Symbian \EPOC Connect or \Program Files\PsiWin). Further details about installing the SDK are in the documentation Quick Start chapter (under Introduction).

As well as HTML versions of the documentation, there are compiled

↑The EPOC emulator simulates a Psion hand-held PC, so you can test your programs.

→ Installing the SDKs

Preparing a drive for installing the SDKs

You must install the EPOC SDK in the root directory of a drive. We recommend that you create a clean drive using one of these methods. However, if you don't mind a few extra directories in your top directory, you can skip this section.

1. (NT Only) Use shared drives – make a directory, for example c:\EPOCSDKs\, select it in the NT4.0 Explorer and use the Sharing... option on the right-click menu to share. Use Tools | Map Network Drive to connect to it. Alternatively, from File Manager use Disk | Share As, and then use Disk | Connect Network Drive to connect.

Use the Reconnect at logon box to make the share permanent. This method enables you to share your work with others if you are on a network. If you do not want to do this, set the share permissions appropriately.

2. Alternatively, use a substed drive – make a directory and use the subst command to map this to an unused drive letter, for example drive e:

```
subst e: c:\EPOCSDKs
```

Install this subst command in your autoexec.bat or into some convenient command file that you run before every EPOC development session. On Windows NT and Windows 95/98, the subst command makes the mapped drive visible to all programs immediately (though neither File Manager nor Explorer will not update their available drive list immediately).

Help versions in the \sysdoc\htmlhelp directory of the hard disk on to which you installed the SDK. These are particularly useful because they include a powerful search facility. If you want to use these versions of the documentation, you will need a browser for compiled HTML Help files (*.CHM), such as Microsoft Internet Explorer 4.0 or above.

To install and run software on a 'real' EPOC device, you will need an EPOC device using EPOC Release 1 or later (unless otherwise stated), EPOC Connect 2.1 or above, or badged version such as PsiWin and a link cable.

Developing and using the EPOC SDK for Java

The EPOC SDK for Java consists of a Java Runtime Environment (JRE), documentation and tools. The JRE is based on Sun's JDK 1.1.4, and includes a Java Compatible Virtual Machine (JVM) for EPOC that enables you to run Java programs on the EPOC emulator. These programs can be 100 per cent pure Java, or can use a mixture of pure Java and native code.

You can develop and test pure Java applets and applications using just this SDK and the Java development environment of your choice. For example, you can download Sun's JDK 1.1.8 without charge from java.sun.com/products/jdk/1.1/. You could also use Borland's JBuilder 2 that was on the August 1999 **SuperDisc**.

If you intend to develop native methods for use through the Java Native Interface, you will also need the EPOC Release 5 C++ SDK and Microsoft Visual C++ version 5 or 6.

This SDK assumes that you are familiar with the Java programming language and with a Java development environment. It does not provide a Java tutorial. If you are new to Java, there is a useful online tutorial at java.sun.com/docs/books/tutorial/.

This SDK does not assume prior knowledge of EPOC – it contains essential background information on EPOC relevant to Java developers. You will find detailed EPOC documentation in the EPOC C++ SDK.

You should read the installation notes on the CD in the file \full\Symbian\Java\sysdoc\java\sdk\jvinstal.html

Where to start

Suppose you have installed the EPOC SDK for Java on to the E: drive of your PC. In E:\erj\demo\HelloWorldApp\, you will find a .java source file and a class file for HelloWorldApp. You can run this class in the EPOC Runtime for Java as follows:

1. Start up the EPOC emulator from the Start Menu entry that will have been created when you installed the SDK.

2. Click on the C beside the EPOC System icon in the bottom left-hand corner of the screen. A pop-up menu should offer you a choice to select drive C or J. Select J.

These drive letters are virtual drives used by the EPOC emulator. The directory E:\epoc32\Wins\C\ on your PC is mapped to C:\ within EPOC, whereas E:\erj\ is mapped to J:\. Thus, you will find the file HelloWorldApp.class in J:\demo\HelloWorldApp\ on the EPOC Emulator. Navigate to it by double-clicking on the \demo and the \HelloWorldApp folders in turn.

3. Finally, you can launch the application by double-clicking on the class file. All being well, you will see Hello World! printed in a console followed by the message Console closed – press any key. When you press any key the EPOC emulator, not just the application, will close down – a limitation of the Windows-based version of the EPOC runtime for Java. On a real EPOC machine, you would be taken back to the default EPOC Shell.

You can launch any class of your own (provided it is in the default package) in exactly the same way, by placing it, say, anywhere in the directory sub-tree below E:\erj\. If, however, your application is compiled as a member of a named package, you will need to launch it using one of two other methods.

The first, more straightforward method is by passing the class file as an argument to E:\epoc32\release\wins\rel\java.exe. The Deployment Reference chapter in the SDK documentation explains the exact syntax required to do this. It also explains how to extend the classpath, pass other parameters to the VM and so on.

The second method is by installing your class as an EPOC application that will appear on the Extras bar (launched by clicking at the bottom right-hand corner of the emulator screen). The Deployment Reference also gives details of what is required to do this.

Note that the addresses of files passed to java.exe are relative to EPOC virtual drive mappings, not Windows drive mappings.

Developing and using the C++ SDK

Program in EPOC's base language

C++ is EPOC's native language. EPOC is object-oriented in its design, giving the compactness and re-use essential to produce efficient software for the device classes it targets. All non-privileged system facilities are directly accessible via C++ APIs available in the C++ SDK.

The principal platform for all EPOC development is the Microsoft Windows-hosted EPOC Emulator. The Emulator uses the Win32 API to emulate the underlying hardware services required by EPOC devices. It implements all user-side EPOC APIs exactly as on an EPOC machine to provide full emulation of a generic EPOC device.

EPOC C++ software is built and debugged on the EPOC Emulator/Microsoft Visual C++ combination, and then rebuilt for target machines using the customised GNU C++ Compiler implementation that is supplied with the C++ SDK.

You will see references to WINS builds and MARM builds in the documentation. This simply relates to the type of target device. When you compile your code with Visual C++, you are compiling a WINS build for the emulator. Once you are satisfied with the results, you then use GNU C++ to build the MARM version for a target device such as the Psion Revo or the Ericsson MC218.

EPOC has many powerful features. It is easy to get a little over awed to begin with, but don't worry. Follow these tips and you will be an EPOC expert in no time!

Where to start

Install the SDK, run the emulator and look around. This is particularly useful if you are not familiar with EPOC devices. Links to all items such as the emulator and the system documentation are added to the Start menu during installation. However, the emulator can also be launched manually from \epoc32\release\wins\deb\epoc.exe

First, you should read the Getting Started section of the SDK documentation. Next, compile and run one of the example applications. Most of the sample projects can be built and run using the ebld batch file. Type ebld at the command prompt for a description of the available options.

Example: build and run the simple example for WINS (debug build):

```
cd \epoc32ex\store
ebld stsimple wins deb
ebld run stsimple deb
```

To build all the example projects in the STORE component:

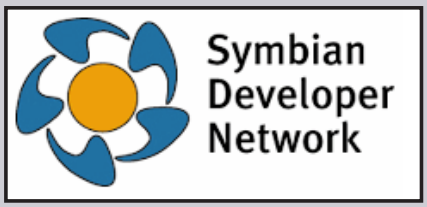
```
cd \epoc32ex\store
ebld all wins deb
```

To build the .dsp file for the Visual Studio (V5 or 6):

```
ebld makmake stsimple vc5
```

For instructions that are more detailed, see the SDK documentation chapter entitled C++ System Documentation in the section SDK Examples, subsection About the example projects.

You should also work through the tutorial exercises, details of which are in the EPOC Tutorial chapter of the manual.



↑The Symbian Developer Network is Symbian's developer service organisation. It provides support and information to help software developers produce well-written and stable applications for Symbian-based devices.

Developing and using the OPL SDK

PCPlus SUPER DISC DVD ONLY

Organiser programming made easy

The EPOC Release 5 OPL SDK provides a PC-hosted development environment for rapid application development in OPL. It comprises the EPOC Release 5 system components, development tools including the EPOC emulator, system documentation, and examples.

OPL (Organiser Programming Language) is a Symbian-proprietary language with a long heritage in Psion's Organiser range. It provides a BASIC-like syntax, and its easy accessibility and shallow learning curve have spawned a vigorous development community.

Once you have installed the SDK, you will have two options for developing applications on your PC:

1. Use the supplied emulator to write, translate and test code with the built-in Program application just as you would on a real EPOC-based device.

2. Write your code in a text editor and use the command-line based OPLTRAN tool to translate it from source into the OPL program executable. Details of how to use this tool are supplied in the SDK documentation, but a text editor of your choice will be needed to write code in if you wish to use this tool.

Where to start

You can find details of how to produce your first program in the SDK documentation in the chapter EPOC OPL Guide & Reference, section Introducing OPL; subsection A first program. This walks you through creating a program using the supplied 'emulator' software.

A simple tutorial on how to use the OPLTRAN tool to produce OPL programs from the Windows command line can be found in the OplTran section of the EPOC OPL Guide & Reference topic.

The OPL SDK comes with full system documentation. After the SDK is installed you should be able to access this from X:\sysdoc\oindex.html (where X is the drive onto which you installed the SDK). The SDK install procedure will have created EPOC Software group on your Start menu. Inside this group, the EPOC OPL SDK Documentation and 'EPOC OPL SDK Documentation HTMLHelp shortcuts will also lead you to the documentation.

Developing and using the Connectivity SDK

PCPlus SUPER DISC DVD ONLY

Create intergrating programs for PCs and hand-helds

Integration between a Symbian-based hand-held and Microsoft Windows PCs is achieved using the EPOC Connect product (badged by Psion as PsiWin). This provides a seamless interface between the PC and hand-held, enabling a connected EPOC-based hand-held to appear as an icon on the PC desktop and within the Microsoft Explorer.

To provide document exchange across platforms, EPOC Connect provides a series of converters for most major document formats on the two platforms. Using the converters, a user's text document may be transferred between EPOC Word and Microsoft Word/WordPerfect, a spreadsheet between EPOC Sheet and Excel/1-2-3 and so on without manual intervention.

EPOC Connect also enables the synchronisation of calendar files between the hand-held and different products on the PC platform. Thus, a user's diary information may be transferred without intervention from EPOC Agenda to Schedule+, Outlook and so on with updates performed automatically.

As new products come to market, the architecture of EPOC Connect enables new converters to be added easily and for data in existing file formats to be readily extracted. Synchronisation on new software products is also supported; this SDK details the information required to implement these.

Where to start

Examples are installed to the \connsdk subdirectory of your installation drive and using them is discussed in the SDK's Quick Start chapter. A selection of C++ and Visual Basic code is supplied to get you started.

The Symbian Developer Network

On the **SuperDisc**, Symbian has provided the latest Software Development kits from the Symbian Developer Network.The Symbian Developer Network is Symbian's developer service organisation. It provides support and information to help software developers produce well-written and stable applications for Symbian-based devices.

Free membership

Membership of this online community is free. Just register online to receive your username and password, giving you access to download the Software Development Kits newsgroups dedicated to the development language you are using, technical papers, knowledgebases, tutorials and more.

If you require support from Symbian's own support engineers, you can join as a Professional member. As a Professional member you get access to member only discussion forums with Symbian engineers, to beta versions of forthcoming releases, and early information about upcoming training and developer conferences.

For those who require confidential and secured access to Symbian support engineers you can purchase Premium Support packages. You will have your own support forum that is only accessible by you and your colleagues, and is monitored by Symbian support engineers.

↑The Symbian Developer Network can help you develop your software.

Further information

For further information on Symbian see www.symbian.com; if you want more information on developing for Symbian see www.SymbianDevNet.com

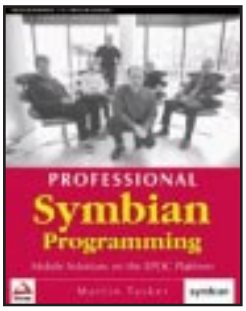
Professional Symbian Programming

Mobile Solutions on the EPOC Platform

Whether you are new to the Symbian platform or are an experienced EPOC developer, you will find the Professional Symbian Programming book invaluable. For the first time, a single book covers the whole breadth of the Symbian programming experience, including the core EPOC C++ APIs, Java implementation, porting to EPOC, WAP, PC-based connectivity, and rapid application development in OPL.

Professional Symbian Programming starts with the basics: where EPOC came from, how it works and the demands and opportunities of mobile devices. The book contains an authoritative and comprehensive introduction to EPOC's C++ APIs for strings, error handling and data management, GUIs, comms and system programming.

Wrox Press has assembled an expert team, led by Martin Tasker, Symbian's Head of Technical Communications, who has participated in EPOC's development since the beginning. Chapters are also contributed from Symbian specialists Jonathan Allin, Jonathan Dixon, Mark Heath, Tim Richardson, and Mark Shackman, with a chapter on porting from John Forrest of Purple Software, a leading EPOC software house.



↑Professional Symbian progamming, from Wrox Press.

The book is available from Wrox Press (www.wrox.com), from your local bookshop (ISBN: 186100303X) or from your favourite online bookstore.

Getting started with the EPOC emulator

The Psion 5mx emulator explained, in order to make creating EPOC-based software easier

1 So that you can test your newly created programs, a Psion emulator is included with all the SDKs. This emulates a Psion Series 5MX/7. Run it from the Start-EPOC menu.

2 The emulator mimics the Psion platform perfectly. All the major programs are launched by clicking on the main toolbar at the bottom of the device. The main menu is accessible from the top left icon on the screen.

3 The buttons down the left-hand side of the screen are for Zoom, Infrared connections and Cut and Paste. These all are fully-functional in this emulator. When in the System window, the icons on the right of the screen enable you to create and delete folders and files.

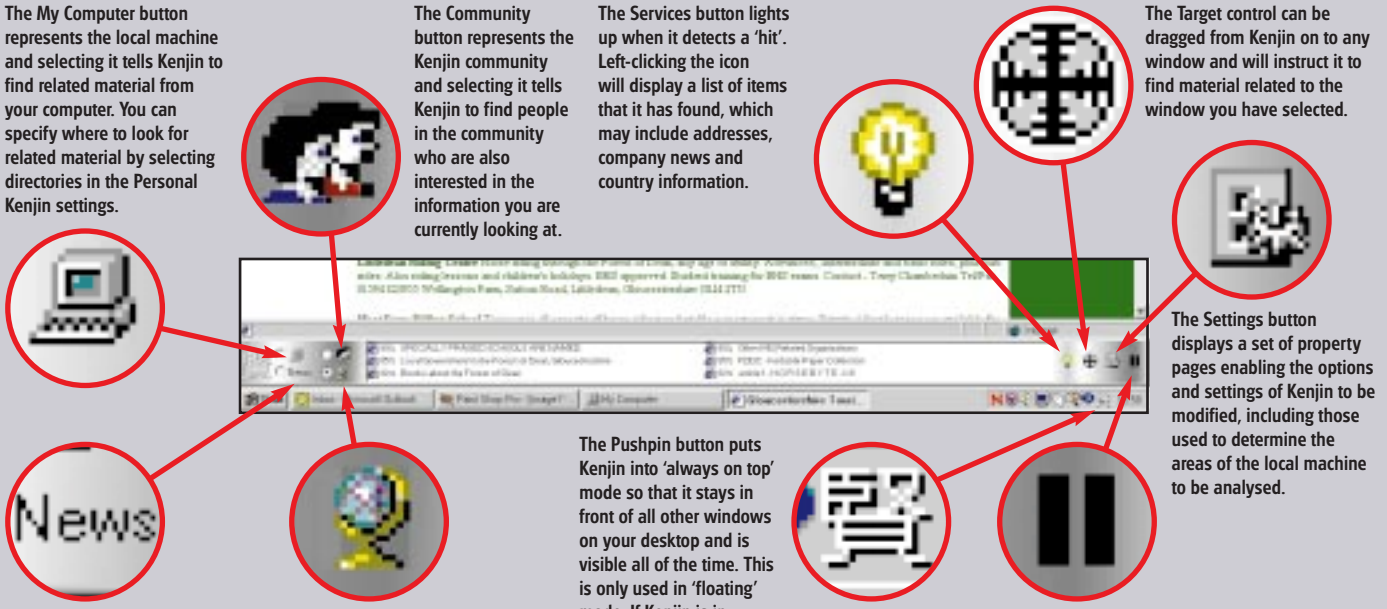
4 Once you've opened a program, it doesn't shut down when you view another. It's much like Windows –it needs you to tell it to close the program. To do this, click the top right of the screen where the active programs name is, and tell it to shut down each program in turn.

5 When you've created programs with the SDKs, you'll want to try them out. The emulator's hard drives are located at c:\epoc32\wins\c\ for the c: drive, and c:\epoc32\wins\z\ for the z:drive. Place your programs here to test them.

6 From here, you can create all kinds of software for the EPOC platform, and test it thoroughly, too. There is plenty of useful documentation available when you install the product. Enjoy.

The toolbar

Kenjin's toolbar may look a little daunting, but it's easy-to-use



The My Computer button represents the local machine and selecting it tells Kenjin to find related material from your computer. You can specify where to look for related material by selecting directories in the Personal Kenjin settings.

The Community button represents the Kenjin community and selecting it tells Kenjin to find people in the community who are also interested in the information you are currently looking at.

The Services button lights up when it detects a 'hit'. Left-clicking the icon will display a list of items that it has found, which may include addresses, company news and country information.

The Target control can be dragged from Kenjin on to any window and will instruct it to find material related to the window you have selected.

The Settings button displays a set of property pages enabling the options and settings of Kenjin to be modified, including those used to determine the areas of the local machine to be analysed.

The News button represents the News source and selecting it tells Kenjin to find related material from the News repository.

The Web button represents the Web source and selecting it tells Kenjin to find related material from the whole of the Web.

The Pushpin button puts Kenjin into 'always on top' mode so that it stays in front of all other windows on your desktop and is visible all of the time. This is only used in 'floating' mode. If Kenjin is in Toolbar mode it is visible all of the time, irrespective of the pushpin status.

The Pause button pauses the suggestion mechanism so that the current set of results will not be replaced by new ones until the button is pressed again.

Internet service

Getting started with Kenjin

PCPlus SEE YOUR SUPER DISC

If the road to enlightenment is too rocky, **Paul Ravening** recommends that you consider this home delivery service

www.kenjin.com

Kenjin, which is Japanese for wise man, is the first Internet information service that delivers the right information to you exactly when you need it – no matter where it happens to be. Joining together your PC and the Web, Kenjin is the only service that understands the content in your browser, in your e-mail client or office productivity applications, then automatically delivers links to related information.

Getting started

The first time you run Kenjin, you'll be asked to register your details with the online registration server. Once it has been accepted, you will see its registration confirmation window. There will be a message on how to use Kenjin and, once you have acknowledged this message, you may start using it.

Kenjin can be run automatically when starting Windows, manually from the Start Menu or from the icon optionally installed on to the desktop. Once Kenjin is running, an icon appears in the System Tray.

When Kenjin launches, it also reminds you which keys are currently designated as hotkeys. You can use these hotkeys at any time to tell Kenjin to generate and display suggestions of related content, or links to relevant information. Its suggestions are always based on the content that is in your active application window. Kenjin displays a message containing proxy server information and then displays the proxy settings page.

Kenjin then automatically examines the document in the active application and, if related material is available, a tick appears on the icon. You may then click on any of the links in the Kenjin window to take you directly to the related material.

Suggested sites

You can also make Kenjin suggest a site related to a specific piece of text by either highlighing it and then dragging the highlighted region to the Kenjin window, or clicking on Kenjin and typing in the text you wish. This will temporarily replace the suggestions window with a text-entry window and will display the text you type. Both of these methods force Kenjin to immediately look for related material.

While Kenjin is establishing a network connection, if there is heavy network traffic or if Kenjin is unable to establish a connection, a cross will be shown to indicate that no related material can currently be suggested.

The Services button will light up when it detects a hit. Left-clicking the icon will display a list of items that it has found, which may include addresses, company news and country information. To view any of these, simply select it from the menu. PCP

Wireless applications

Ericsson WAP SDK

The next big leap in the information age is WAP. But what does it mean and how do you get started?

PCPlus SEE YOUR SUPER DISC

www.ericsson.co.uk

PC Plus is pleased to bring you Ericsson's WAP Service Development Kit and two WAP phone emulators which, via a link to the Internet on your PC, will enable you to try out the power of WAP for yourself, without buying a phone. With the SDK, you can try your hand at programming in WAP and test your results out on the emulators. WapIDE is an SDK (Service Development Kit). It is a complete development environment that enables third party companies to develop and test WAP applications quickly and easily. WapIDE consists of three different tools:

1. The Application Designer enables you to create, compile and test WML and WMLScript applications quickly and easily.

2. The WapIDE Browser enables you to access WML decks and cards using a simulated WAP device. It includes a graphical UI, WML and WMLScript byte code interpreters, and simulated WTA event handling. The Browser simulates a WAP device and interprets cards, decks, and scripts written in WML; it is used primarily to view applications, that is, to browse WML cards; it interprets WMLScript; and it can also be used as a WML browser instead of using a WAP device to access WAP applications developed by you or others. The promise of wireless technology is its ability to expand the potential of personal applications. Forecasts indicate that everyone in industrialized countries will eventually own one or two mobile devices and that these will be the preferred tool for personal voice and data communication.

3. The Server Toolset includes compiler and library tools which let you try your dynamic WAP applications and help you with sample code examples, including WML and WMLScript compilers and Perl for creating dynamic WML source.

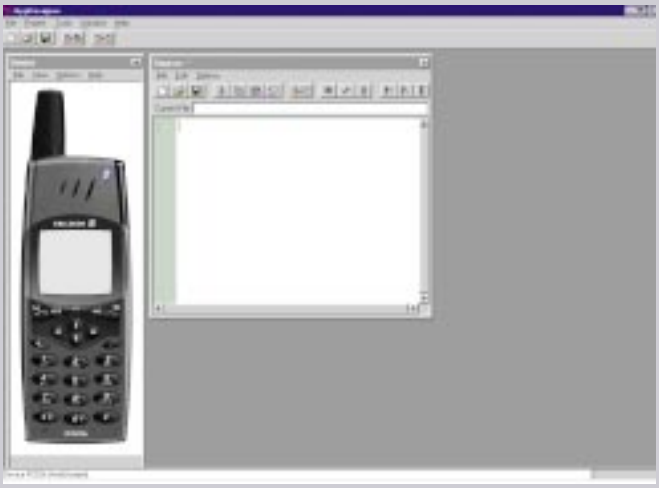
With the future of WAP in mind, companies are now developing Web sites to support WAP developers, and Ericsson is no exception. Ericsson Developers' Zone has been created for application developers and its goal is to help you access the wide range of mobile application technologies and products Ericsson can offer technologies such as WAP, Bluetooth, EPOC, SMS, GPRS and Mobile Positioning.

There are a number of Competence Centres around the world, including one based in the UK where you will find in-depth knowledge, verification facilities, support and consultants who can help you to develop solutions for a variety of technologies and products. If you are interested in signing up, registration forms and further information can be found at www.ericsson.com/developerszone. Once registered, you will have access to valuable information and tools, which enable you to build and test applications.

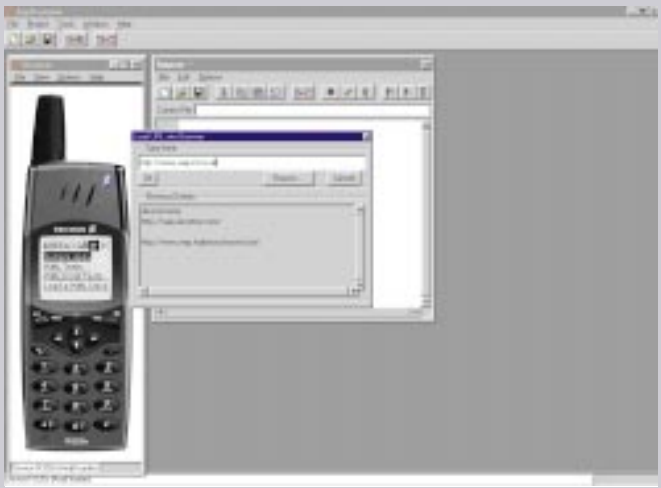
Paul Ravening

Getting started

Explore WAP and all you can do with it



1 There are three ways to load content to the browser: from a WAP gateway using WAP client stack, a Web server using HTTP client; or a file containing content saved on the PC you are running WapIDE on. In all these cases you have to enter an URL to access the application you want. When the device is activated, WapIDE automatically loads a welcome deck with links to some sample applications provided in the installation. If you aren't sure which button it is, select Device Info from the Help menu.



2 Applications are accessed by URL. To load a URL, you must first be sure that the device is on, then select Load URL from the File menu. Now you can do one of the following: Type in the address as a normal Internet URL, for example wap.fictional.ericsson.com/welcome.wml, or select an URL from the field Previous Entries. Failing that, you can use browse to find a WML or a binary WML file on your computer.

3 Here's a quick look at the application designer in action. We've put together a small script on the right and clicked on the Test button on the top of the page. The application designer then shows your program in all its glory in the WAP device on the left of the screen. Be sure to read the manuals included, as this is quite a complex product. But don't let that put you off – it's fun, and it's the future!

Full Linux OS

Linux Mandrake 7.1 ISO Image

PC Plus SUPER DISC DVD ONLY

If you have a CD Burner then you can get your hands on the latest release from Mandrake on this month's DVD

Only a matter of months ago, installing Linux was a fairly arduous task: First you collected arcane information about your hardware; then you defragged your hard drive and fired up a frightening DOS utility that (hopefully) shrunk your Windows partition to make room for the new OS; next you created a boot disk (more fun with DOS); and finally you battled your way through a text-based installer.

With Mandrake 7.1, those days are gone. Installing a whole operating system will never be a trivial task, but DraX, Mandrake's graphical installer, makes it deceptively simple.

Required reading

Included in the ISO on the **SuperDisc** is a comprehensive Install Guide in HTML. It's required reading before beginning any installation. Open up the 'docs' folder and double-click on index.htm. Most of the points covered here are explained in more detail in the guide.

There are two basic installation methods: You either give Mandrake its own partition on your hard drive; or you install it under Windows on your Windows disk. If you're curious and want to see Linux in action before deciding whether to keep it, give the second a try – you won't have to divide your hard drive up into new partitions and removing Mandrake is easy.

There is a downside. Linux runs slowly from a Windows partition. And Linux4Win, the program that installs Mandrake under Windows, is still in beta. Despite what it says, it will only install to your C drive. Both virus checkers and Iomega Guest, which run at startup, prevented it from working on our test machines.

Give Mandrake a home

We strongly recommend you give Mandrake a permanent home on your system. With Mandrake's new installer there's no messing about with dodgy DOS partitioning tools. If you choose the defaults, it will automatically shrink your Windows partition to fit. And if you're an old pro, you can chop up your drive any way you want.

There's another advantage of putting Mandrake on its own partition: if Windows dies, you can always rescue your data from Linux. Mandrake is good at detecting hardware, but not perfect. If your computer is fairly new and you aren't using any arcane bits of kit, everything should go fairly smoothly. But it's worth right-clicking on My Computer and having a peek under properties to see if you've got any old ISA devices that might not be detected. See section 3.2 of the Install Guide for details.

Some devices, such as sound cards and zip drives, are configured after installation, but don't worry about them for the moment. Not all are supported – Section 8 of the Install Guide details detecting them.

If you're giving Linux its own partition, give your drive a defrag to free up more space. Open My Computer, right-click on the drive and select Properties. Then click on the Tools tab and click Defragment Now. Once it's done, run Scandisk over it to make sure everything's fine, then dive on in!

Matt Kynaston and Rob Fenwick

Getting help

Run into a problem? Or have some questions? Help is at hand

↑Got a question you want answered? Why not visit the **PC Plus** Linux forum.

PC Plus cannot offer phone or e-mail support for Mandrake or other Linux programs on our discs. But don't panic – we host an extremely active Linux forum. Visit our Web site or point your newsreader at news://nntp.futurenet.com/pcplus.linux.

www.pcplus.co.uk

Your question may well have been answered already, so read the previous postings. If you do ask a question, please send it in plain text, not HTML.

Burn it!

The distribution is included as an ISO image this month, so read this first...

You cannot simply insert your **SuperDisc** in to your DVD-ROM drive and install Linux Mandrake 7.1. The file on our **SuperDisc** this month is an ISO image, suitable for reading by CD burning software. You will need to have a CD-R or a CD-RW drive to create an installation CD.

We had to create an ISO image this month, due to a peculiarity of single-sided DVD duplication. In the future, we plan to run double-sided 'special' DVDs, including a Linux distribution. In the meantime, for those of you with a CD Writer, you can get your hands on this top new distribution!

If you are unsure about how to burn an ISO image, please consult your manual, or visit our forums at www.pcplus.co.uk.

FORUM www.pcplus.co.uk/forums/linux

Installing Linux

Mandrake is one of the easiest distributions to install. Here we walk you through the main steps

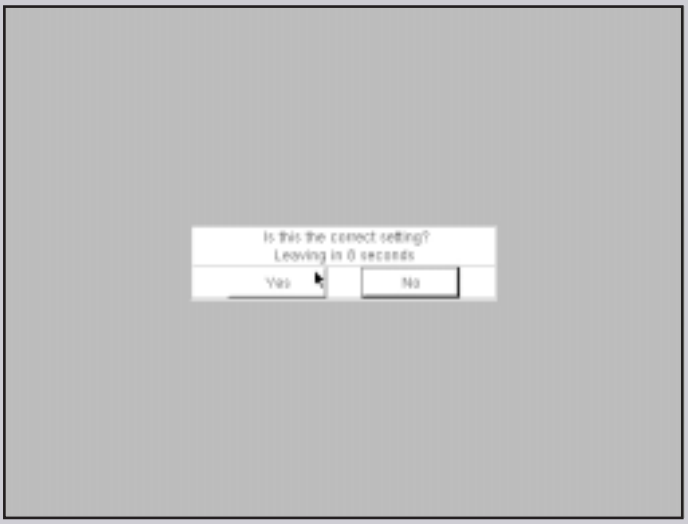
1 Defrag your hard drive, then run Scandisk over it to make sure all's OK. If your computer is set up to boot from CD-ROM, simply put the disk in your drive and restart. Otherwise, see section 4.2 of the Install Guide to create a boot disk. The graphical installation is self-explanatory, so we'll only cover the important steps here. You'll be prompted to choose your language, then your Install Class. Click Recommended.

2 At the Install or Upgrade screen, choose Install. Then choose your keyboard layout. Unless you're using Linux4Win, next comes the step which used to cause so many problems: partitioning. But using the Recommended install class, the installer does it all for you! Your Windows partition will be resized and the necessary Linux partitions created.

3 If you've got a printer connected, you can set it up now. See section 7 of the Install Guide for details. It's not difficult to set it up after installation if you'd rather leave it. Next, you will be prompted to enter a root password. The 'root' user is the only person allowed to alter your system configuration, so make the password difficult and don't forget it! In the following screen, set up the user you will log in as for day-to-day tasks.

4 You'll be asked to create a boot disk. Say yes and keep it somewhere safe. If anything goes wrong with Windows and you have to re-install, this will be your only way back into Linux. If you're using NT, you will need the boot disk to start Linux until you've added it to your WinNT/2000 boot loader (see the 'Linux+NT boot loader' HOWTO at www.linuxdoc.org for details).

5 LILO, or the Linux Loader, enables you to choose whether to boot into Linux or Windows. For most systems, the installer will put LILO in the right place. But, if you're using WinNT/2000, Norton System Commander or a similar application, choose 'First sector of boot partition'. Otherwise select 'First sector of drive'.



6 Finally, the installer sets up X Windows, the graphic interface. Unless your graphics card is very old, you should see the screen above. If it looks OK, click Yes before it times out, and also answer Yes to run the graphical interface when booting. Congratulations! You're done! (If you don't see this test screen, you will have to configure your card manually after install. See the Install Guide for details.)

LINUX SOFTWARE

More great Linux software

Our **SuperDisc** is packed full of top Linux software. **Rob Fenwick** shows you the best of the rest...

Pan is a graphical nntp client for Linux.

PAN Newsreader

Talk to PC Plus!

When it comes to Linux newsreaders, by default you are usually stuck with one of many text-based newsreaders, Netscape or KRN. With the possible exception of Netscape, none of them are much good as a graphical, threaded newsreader.

Applications like GNUS and SLRN have their place. They're effective over telnet or ssh, and they're also popular with the hardcore Linux power users who see the command line as their best friend.

But the world is, for the most part, moving into fancy GUI utilities, so we've focused on one of the leaders of the Linux pack here. Pan is built with the GTK+ libraries. We've included an gzipped tarball of the source code on the **SuperDisc** this month, and Maurice Kelly covers the installation of the software in **Linux Masterclass** on page 160.

Wise wizard

The first time you launch Pan, a wizard appears to walk you through the basic configuration process. Once you've set it up, you should select Preferences from the Edit menu. If you select the General option from the list at the left, you can alter the messages that are displayed when you reply to a newsgroup post.

The example given is "n article %i, %a wrote:" %i and %a are variables that change for each message that you reply to – %i refers to the unique article ID, %a specifies the author of the post you are replying to and, in addition, you can use %d to insert the date.

Getting personal

You can customise this field, so, for example, you might change it to "On %d, in message %i, %a prattled on about this:". Next, select the Mail Server option and enter your SMTP server name – this enables you to reply directly to a post by e-mail rather than through the newsgroup. Once all that is done, click OK to be returned to the main interface. Open the Server menu and select the Get List of All Groups option.

Halfway down the list, you'll find groups called pcplus.* – if you right-click on each one and click the Subscribe to selected option, you can download the message headers for all of the available posts. You can do this by selecting Get new article headers from the Groups menu.

You can dive in and post about anything and everything – recent discussions we've seen range from faulty hard drives to purple carrots growing out of people's floppy drives.

Glade

Develop DTK+ applications in Linux!

Until very recently, building applications using GTK+ consisted of a forever growing and forever tedious number of lines along the lines of:

```
GtkWidget *
gtk_entry_new ( void ) ;
```

Glade is a complete RAD environment for Gnome, that takes the long and arduous task of building the individual widgets of an application out of the hands of the programmer. The application has the look and feel (but not yet the functionality) of Inprise/Borland's Delphi and C++ Builder IDEs, with a simple drag and drop component palette and form layout.

Building GUIs has never been easier.

PHP 4.0

Dynamic Web sites

PHP is the hypertext processor that is slowly bringing completely database driven dynamic sites to the masses. PHP uses embedded PHP script in regular HTML pages to make database queries, call include files and so on. The PHP script itself is very much like 'C', and is relatively simple to pick up.

When you couple PHP with Apache and MySQL, you have a complete Dynamic Web Database system. This is exactly what we'll be achieving in Linux Expert Masterclass over the next few months, so stay tuned!

Wine

Running Windows applications under Linux

To my mind, this is one of the most exciting projects currently being developed for GNU/Linux. This statement from the WINE site introduces it nicely: "WINE is an implementation of the Windows 3.x and Win32 APIs on top of X and Unix. Think of WINE as a Windows compatibility layer. WINE provides both a development toolkit (WINElib) for porting Windows sources to Unix and a program loader, enabling unmodified Windows 3.1/95/NT binaries to run under Intel Unixes. WINE works on most popular Intel Unixes, including Linux, FreeBSD, and Solaris.

WINE does not require Microsoft Windows, as it is a completely alternative implementation consisting of 100 per cent Microsoft-free code, but it can optionally use native system DLLs if they are available. WINE comes with complete sources, documentation and examples and is freely redistributable.

The WINE project started in 1993 as a way to support running Windows 3.1 programs on Linux. Bob Amstadt was the original coordinator, but turned it over fairly early on to Alexandre Julliard, who has run it ever since. Over the years, ports for other Unixes have been added, along with support for Win32 as Win32 applications became popular."

Wine status

As of mid-2000, WINE consists of over 540,000 lines of C code, written by more than 300 developers from dozens of countries around the world. WINE is in active use by an estimated 90,000 people. WINE implements more than 90 per cent of the calls in popular Windows specifications such as ECMA-234 and Open32. New snapshot releases appear approximately every two weeks. WINE is still under development, and is not suitable for general use. Nevertheless, many people find it useful in running a variety of Windows programs.

Try these freeware tools

20 Windows utilities

PCPlus SEE YOUR SUPER DISC

Lots of great stuff which make your PC do that little bit extra...

1.Aladdin Expander
Trawling across the Internet you'll find lots of different compression formats, including formats originating from UNIX and Mac operating systems. Aladdin's Expander will cope with all the most commonly-used formats, including .sit, .arc, .arj, uuencoded, gzip and BinHex encoded files.

2. BCWipe
BCWipe is a great utility for securely deleting files and folders from your disks. Instead of just marking the space as free (which is all that Windows and DOS do), BCWipe overwrites all the space previously used by each file before deleting it.

→3. Axel CD
A great looking CD player utility for your PC

↑Looks good and sounds good. What more could you want?

If you've ever heard someone say that they are not interested in looks, they're probably not being totally truthful. Looks are important and this Axel CD player is the best looking piece of software to arrive on our desks in quite some time.

4. Capture Express 2000
Capture Express is more subtle than most screen capture utilities – it installs itself as a system tray icon, and assigns a screenshot 'Hot Key' – [F11] by default, but you can alter this. It's a powerful tool which you can pre-configure to perform multiple operations with the tap of a single function key.

5. Forte Freeagent
If you make heavy use of newsgroups, then this is for you. You can mark messages for bulk download to read off-line, you can start multiple downloads at once and it'll stitch together attachments that have been split across multiple messages.

6. HTML Kit
WYSIWYG is for wimps. If you're conscientious with your code and you have to write every last tag yourself, then you may well have looked at Allaire Homesite 4.0. HTML Kit not only looks similar to HomeSite but has all of the functionality of the application and, in some areas, it performs above and beyond the level of HomeSite.

7. Registry Lite
The need to edit the registry is an unfortunate fact of life for Windows users. Regedit.exe, which is shipped with Win95/98, is a bit dull, and it's just a little bit too easy for things to go wrong. Registrar Lite lets you bookmark keys that you refer to often, and it also enables you to add a custom description for each key. An essential tool.

8. ShortKeys Lite
Do you ever find yourself having to type the same information over and over again? What you need is a macro utility to do the hard work for you. It enables you to define a series of up to 35 hotkeys and assign strings of text to each. This way you can hit a single key and insert your whole address or such similar task.

9. ATNotes
ATNotes is a freeware program which creates Post-it like notes on the Window's desktop. The user interface is provided through an icon in the taskbar and supports both English and German, (it is set automatically according to the system default language).

10. CD Check
CD Check is a small but useful freeware utility which checks freshly burnt CDs, bit for bit, to make sure you've got an exact copy of the original data.

12. JED 4.0
If you maintain any database or document that is deemed by your employers to be 'commercially sensitive', then you should be encrypting that valuable data. JED 4.0 enables you to do just that quickly and easily.

13. Monday Backup
This excellent little utility backs up critical system files every Monday. You can easily restore things when system problems occur. Monday Backup also includes Monday Cleanup, which optionally cleans History, Recent and Temp folders on start-up every Monday.

14. SpineText
SpineText is a simple notepad which looks like the standard Windows notepad. It includes a spell checker, HTML support, and even encryption of text files in its own native format.

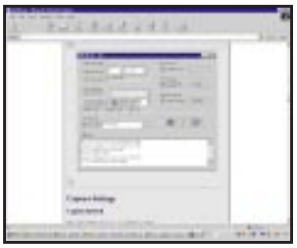
15. Stash
Want to leave your mark on a picture? Stash will insert hidden text into your images, ideal for protecting your hard work from plagiarism.

→11. XEarth
Stick the world on your desktop – literally

If you are familiar with the UNIX/Linux operating systems, you will probably have come across XEarth before. XEarth places a 3D graphical representation of our big blue and green mass on your desktop, and updates it so that you see the area currently bathed in sunlight.

↑By using the time stored on your PC, XEarth works out just what parts of the Earth are in sunlight.

→16. pjWeb Cam
Voyeurs of the world, unite



↑You too can have a WebCam up and running on your Web site.

pjWebCam enables any Windows capture device that uses Microsoft Video System to be accessed over the Internet or an Intranet. It will either drive its own Web server for real-time Web server viewing, or periodically send the image to a remote FTP server, or local drive. It can also add a caption to your image on the way up.

17. WAV Browser
Managing collections of sampled sounds without listening to them isn't easy. WAV Browser enables you browse and listen to your .wav files quickly and simply. You can create, copy, move, rename, and delete files. It really couldn't be easier.

18. Whisper
Too many passwords to remember? This handy password manager offers a secure way of storing the lot in one go.

19. GhostMouse
GhostMouse records system-level mouse events that can be played back so the computer can execute applications on its own.

20. Act 9
Stripped-down, lean and mean Web browser.

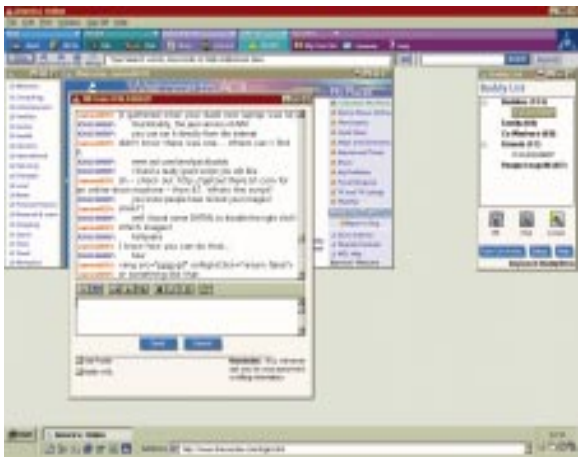
AOL 6.0 BETA

SUPPLIER AOL **TIME TO RELEASE** Approx two months **ONLINE** www.aol.com

It's the biggest name in accessing the Internet worldwide, but will its new software help win over its critics?

↑(TOP) AOL has always had some of the best UK orientated content on the Net. The computers section has everything from beginners' tutorials to expert articles.

↑This is the redesigned AOL toolbar. Clicking on a section heading causes a popup menu to appear with more options and tools.



↑Buddy chat was one of the features AOL pioneered. Unfortunately, chatting with ICQ users is not possible in AOL 6.

Until the recent rise of the 'free' ISP, AOL was the biggest service provider in the UK and is still one of the world's largest content providers. The advent of non-subscription ISPs has made AOL's subscription-based service look less of a bargain over the last couple of years, and AOL increasingly relies on its extra services to keep its paying subscribers on board.

Luckily for AOL UK, its content service is excellent – among the best on the Net. Most of the content is highly UK orientated (with US content available if you want it). AOL uses a proprietary client application, rather than standard tools such as Internet Explorer and Outlook Express. This is one of the reasons AOL has often come under fire, mainly because of the failure to keep its software updated and comparable with the products of the big boys – IE in particular. This time, however, AOL has addressed that issue, and the version 6 beta comes complete with an integrated version of Internet Explorer 5.5.

The client application was designed for ease of use. Total beginners have never had any problem navigating the Internet with AOL – there is a lot of help available. However, even experienced users can gain a lot from AOL's unique service.

This beta version is very stable, the

installation speedy, and although it is a big download at the moment, AOL is planning to send out CDs to its beta testers. AOL customers who want to get involved in the beta test can go to keyword 'Beta' in AOL 5 and sign up there.

There isn't much that is fundamentally new about the client application – other than minor changes to surfing procedures, and access to the Internet, little has changed under the skin. But compared to versions 4 and 5, AOL 6 has undergone major cosmetic changes. When you load up, the most striking thing about the new interface is the redesigned toolbar which gives instant access to mail, people, services, settings and favourites. And there are those American voices... "You've Got Mail"...

The re-designed toolbar is now the nerve centre of the application, with all-new pull-down menus for access to frequently-used features. The mail section has 'Read' and 'Write' icons, but for things such as the address book, it is necessary to make use of those pull-down menus. Nevertheless, AOL has missed a great opportunity for customisation, as being able to change icon displays could be a tremendous time saver where one or two features are used more than others.

The address bar is largely the same as the one you will find in IE or Netscape, though the search bar enables you to start an Internet search straight away with AOL NetFind by typing in some keywords. The usual Back, Forward, Stop and Refresh buttons are also provided at the extreme left of the bar.

Unfortunately, as with so many browser integrations, some of the better features of Internet Explorer are lost. The excellent Explorer side-bar and offline browsing facilities are the most sorely missed of these. Happily, use of an external browser for surfing the Web is still possible.

AOL 6 can now send and receive HTML e-mail, a feature noticeably missing from version 5, though many would say that its inclusion is not necessarily a good thing! For those who receive HTML e-mail, this is a much-needed improvement.

Overall, and even at this early stage in the beta test programme, AOL 6 represents a great improvement over previous versions. There are some things that undoubtedly need fixing or improving – some of the error messages, for example, are a little cryptic, but these will likely be addressed by the next beta.

There is one really surprising omission from AOL 6. Even though AOL owns popular Internet rely chat company ICQ, it hasn't yet seen fit to integrate the ICQ software with its ISP client – a missed opportunity, and one we hope it will rectify, as ICQ is one of the most widely used messaging services on the net.

AOL has not yet given an indication of the release date. However, judging by the advanced nature of this revision, we wouldn't be surprised to see it released within the next few months. PCP

Previewed by James Nugent

At last SDRAM on a Flip Chip board.

INTEL i815E DESKTOP BOARD

SUPPLIER Intel **PHONE** 0800 20 2000 **ONLINE** www.intel.com **TESTED ON** 566 Celeron Flip Chip

At last, Intel has put the Rambus fiasco behind it and released what many of us wanted in the first place – a 133MHz SDRAM board

Last year Intel produced its answer to the AMD Athlon chip in the guise of the Coppermine processor. It's a great chip but unfortunately, Intel tried to force us down the Rambus path and use the exorbitantly expensive RDRAM memory. Well, it appears Intel has come to its senses and we've had the chance to look at its pre release offering using the i815 chipset nicknamed the Solano.

Intel supplies two versions of the Solano chipset and the one fitted on this board is the higher i815E spec. They both use the same north bridge, called the GMCH (Graphics Memory Controller Hub) but the major difference is in the south bridge chip that supports four USB ports, ATA speeds of up to 100 MHz and an advanced network and communications slot. On top of this you get 133MHz FSB and PC133 SDRAM.

With on-board sound and a riser card for networking, the i815E does offer a cost effective solution for system builders. Don't expect blistering performance from the built in graphics, though. It's suitable for general use and the avid gamer can always add an extra 3D graphics card to the 4xAGP slot.

Unlike some of the integrated boards that we've seen with the i810 chipset, this one does have plenty of room for expansion with five PCI slots and the Communications and Networking Riser connection. There are other interesting features on the board, including a DVO (Digital Video Out) for connecting to digital displays or TV. Inputs are provided to connect CD audio output to the built in Sound Blaster compatible audio chip and the output for the additional USB ports is conveniently placed at the front of the board, ideal for a couple of sockets on the fascia of the case.

Intel also uses diagnostic LEDs on the back panel to indicate system failures rather than a selection of beeps from the speaker.

One of our test machines uses a similar style of board with the much-loved BX133 chipset and we found little difference in performance between the two. However, the potential of 4xAGP and ATA100 should go some way towards future proofing the board.

With 133MHz FSB, PC133 SDRAM and the socket 370 processor, this board has at last given us what Intel should have produced in the first place. It's quick but doesn't outperform BX133 systems. Watch out for VIA, it plans a new chipset with DDR266 SDRAM that should challenge Intel yet again. PCP

Previewed by Paul Warner